

On Munday being the eighth of this instant, we received intelligence, That Sir George Carteret is very busie with his Pickeroons upon the Western Coast, seizing divers small Vessels; but sometimes they snap short of their prey; and instead of prize receive shipwrack. Amongst the rest, a gallant ship richly laden with plunder'd Plate, and other famous Commodities, was bulg'd upon the Sands neer Corum in Kent, and became a prey to the Inhabitants thereabouts: she is by estimation deemed to be worth forty thousand pounds.

Two hundred sail of Colliers are now bound from Newcastle for London; they put forth on the third of November, and are daily expected at the Hope.

General Blake maintains the Western seas, and expects the coming forth of the Dutch Fleet very suddenly. Vantrump hath tendered an Oath to all his Officers and Sea-men; and unanimously they have vow'd to dispute their Quarrel upon the Neptune Ocean to the last man. But it is the Muzzle of the Canon, and not such Squibs must resolve our Case.

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F I N I S.

9

THE SEA-MANS GRAMMAR:

CONTAINING

Most plain and easie directions, how
to Build, Rigge, Yard, and Mast any
Ship whatsoever.

With the plain exposition of all such
terms as are used in a Navie and Fight
at Sea.

Whereunto is added a Table of the
Weight, Charge, Shot, Powder, and the
dimensions of all other appurtenances
belonging to all sorts of great
Ordnance.

With divers practicall Experiments in the
ART of GUNNERY.

Also the Charge and Duty of every Officer in a Ship
and their Shares: With the use of the Petty Tally.

Written by Captain JOHN SMITH, sometimes
Governour of Virginia, and Admiral of New England.

Novemb. 6
Imprinted at London, and are to be
sold by Andrew Kemb, at St. Margarets Hill
in Southwark, 1657. 1652

THE
SEAMAN'S
GRAMMAR:

CONTAINING

Most plain and easy directions how
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Dimensions of all other specifications
belonging to all sort of Great
Craftsmen.


With an easy method how to measure a
Ship, and how to find the
Area of the Canvas, and how to find the
Quantity of Canvas for a Ship.

Written by Captain J. M. A. & M. T. A. & M. T. A.
Gentlemen of the Navy, and Admirals of the Navy.

Printed at London, and are to be
sold by Messrs. A. & S. W. & S. W. & S. W. & S. W.
in the Strand, 1717.

To the READER,
And all worthy Adventurers by Sea,
and well-wishers to
NAVIGATION.

 Here hath been much already written concerning the Art of War by Land, but nothing concerning the same at Sea, yet perceiving the present occasion to require something of that kinde, I have adventured to bring again to remembrance, those excellent precepts and directions, long since published by Captain *John Smith*, which were almost worne out by time, and herein, if my desire to do good hath transported me beyond my selfe, I intreat your excuse, and take for requitall this bundle of many ages observations; which although they be not so punctually compiled as the Author could have wished, and it may be you expect, yet at present they cannot be much amended; If any will bestow that pains, I shall think him my friend, and honour his endeavours. In the *interim*, accept them as they are, and ponder errors in the balance of good will.


Farewell.

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THE SEA-MAN'S GRAMMAR:

CHAP. I.

Of Docks, and their definitions.



Dock is a great pit or pond, or creek by a Harbour side, made convenient to work in, with two great flood-gates built so strong and close, that the Dock may be dry till the ship be built or repaired, and then being opened, let in the water to float and launch her, and this is called a dry Dock.

A dry Dock.

A wet Dock is any place where you may hale in a ship into the oze out of the tides way, where she may dock her selfe. A Cradle is a frame of timber, made along a ship, or the side of a Cally by her billstoge, for the more ease and safety in launching, much used in Turkie, Spain, and Italy. And the stocks are cer-

A wet Dock.

A Cradle.

The stocks.

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Crab.

tain framed posts, much of the same nature upon the shore to build a Palmace, a Catch, a Frigate, or Boat, &c. And those Docks for building belongs their sides, sides, with Ramps and all sorts of timber; but the Walls and Posts are chained together in some greater water to keep them from rotting, and in season: Also a Crab is necessary, which is an Engine of wood of three claws placed on the ground in the nature of a Capstern, for the launching of Ships, or heaving them into the Dock.

C A P. II.

How to build a ship with the definitions of all the principall names of every part of her principall timbers, also how they are fixed one to another, and the reasons of their use.

The Keele.

The Stem,

The Sterne.

The fashion pieces.

The Rungs.

The Limber-holes.

The first and lowest timber in a Ship is the keele, to which is fastened all the rest; this is a great tree or more, heven to the proportion of her burthen laid by a right line in the bottome of the Dock, or Stocks. At the one end is skarfed into it the Stem, which is a great timber wrought compassing, and all the butt-ends of the planks forwards are fixed to it. The Stern post is another great timber, which is let into the keele at the other end somewhat sloping, and from it doth rise the two fashion pieces like a pair of great horns, to those are fastened all the planks that reach to the after end of the Ship, but before you use any planks, they lay the Rungs, called flore timbers, or ground timbers, thwart the keele; thorow those you cut your Limberholes to bring the water to the well for the pumpe, the use of them is when the Ship is built to draw in them a long harr rope, by pulling it from Stern to Stern, to scower them, and keep them clean from choaking.

Those

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Those ground timbers do give the stee of the Ship, being straight, saving at the ends they begin to compass, and there they are called the Rungheads: and doth direct the Sweep or Mould of the Foot-hooks and Pabell timbers, for there doth begin the compass and bearing of the Ship, those are skarfed into the ground timbers, which is one piece of wood let into another: or so much wood cut away from the one as from the other, for when any of those timbers are not long enough of themselves, they are skarfed in this manner, to make two or three as one: Those next the keele are called the ground Foot-hooks, the other the upper Foot-hooks; but first lay your keele on over your stee timbers, which is another long tree like the keele, and this lying within as the other without, must be fast bound together with strong iron bolts thorow the timbers and all, and on those are all the upper works raised, when the Foot-hooks are skarfed as is said, and well bolted, when they are planked up to the Dlop they make the Ships Hold, and those timbers in general are called the Ships Ribs, because they represent the carcase of any thing that hath ribs. The sleepers run before and after on each side the keele on, on the stee well bolted to the Foot-hooks, which being thus bound do strengthen each other. The Spurkits are the spaces betwixt the timbers alongst the Ship stee in all parts, but them in Hold below the sleepers, are broad boards which they take up to cleare the Spurkits, if any thing get betwixt the timbers.

The Floore.

Rungheads.
Sweep.
Mould.
Skarfing.

Foot hooks.
Keeleson.

Howle.
Ribs,
Sleepers.

Spurkits.

The Garbord.
Garbord stak
Rising timbers

The Run.

The Garbord is the first plank next the keele on the outside, the Garbord stak is the first seame next the keele, your rising timbers are the hooks, or ground timbers and foot-hooks placed on the keele, and as they rise by little and little, so doth the run of the Ship from the floore, which is that part of the Ship under water, which comes narrower by degrees from the floore timbers along the sterne post, called the Ships way aftward, for according to her run she will steare well or ill, by reason of the quicknesse or slownesse of the water comming to the Rudder: now all those

planks

Planks.

Butt-ends.

Tree nailes.

Trunnions.

Whoodings.

The Tucke.

Transome.

Buttocks.

Rake.

The Hull.

Bluffe.

Bluffe-headed.

Billage.

planks under water, as they rise and are joyned one end to another, the fore-end is called the But-end in all Ships: but in great ships they are commonly most carefully bolted, for if one of those ends should spring, or give way, it would be a great troublesome danger to stop such a leake, the other parts of those planks are made fast with good Trunnells and Trunnions of well-seasoned timber, thro'w the timbers or ribs, but those planks that are fastened into the ships stem are called Whoodings.

The gathering of those workes upon the Ships quarter under water is called the Tucke, if it lie too low it makes her have a fat quarter, and hinders the quick passage of the water to the Rudder; if too high, she must be laid out in that part, else she will want bearing for her after workes. The Transome is a timber lies thwart the stern, betwixt the two fashion pieces, and both lay out the breadth of the ship at the buttocks, which is her breadth from the Tucke upwards, and according thereto her breadth or narrowness, we say she hath a narrow or broad Buttock: the Fashion pieces before spoken of, are the two outmost timbers on either side the sterne, excepting the Counters. The Ships Rake is so much of her Hull as hangs over both ends of the keele, so much as is forward is said, she rakes so much forward, and so in like manner astward: by the Hull is meant, the full bulk or body of a ship without masts or any rigging from the stem to the stern: The Rake forward is neere halfe the length of the keele, and for the Rake astward about the fore-part of her Rake forward, but the fore Rake is that which gives the ship good way, and makes her keepe a good winde, but if she have not a full Rake, it will make her pitch her head much into the sea: if but a small Rake forward, the sea will meet her so fast upon the bowes, she will make small way, and if her stern be upright as it were, she is called Bluffe, or Bluffe-headed. A Ships Billage is the breadth of the stowe when she doth lie aground, and Billage water is that which cannot come to the pump, we say also she is bilged, when she strikes on a Rock, an Anchors flaze, or any thing that.

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that breaks her planks or Timbers to spring a Leake.

When you have berthed or brought her up to the planks, which are those thick timbers which goeth fore and aft on each side, whereon both lie the beams of the first Dylop, which is the first stow to support the planks both cover the Holle, those are great crosse timbers, that keepe the Ships sides asunder, the main beam is ever next the main mast, where is the Ships greatest breadth, the rest from this is called the first, second, third, fourth, &c. forward or aftward beams. Great ships have a ttre of beams under the Dylop whereon lies no deck, and great posts and binders called Riders from them to the Kéele in Holle only to strengthen all. But the beams of the Dylop is to be bound at each end with sufficient knées, which is a crooked piece of wood bowed like a knée, that bindes the beams and foot-hooks being bolted together, some stand right up and down, some along the Ship, and are used about all the Decks, some saued or helwed to that proportion, but them which grow naturally to that fashion are the best.

Lay the Dylop with good plank, according to her proportion, so leuell as may be is the best in a man of Waire, because all the Ports may be of such equall height, so that every Piece may serbe any Port, without making any beds or platfozms to raise them, but first bring up your work as before to the second Deck or Dylop, and by the way you may cut your number of Port holes according to the greatnesse of your Ship; by them fasten your Ring bolts for the Tackles of your Ordnances you use Ringbolts also for bringing the planks and Malles to the ship side, and Set bolts for forcing the works and planks together: Clinch bolts are clinched with a riveting hammer for drawing out. But Rag bolts are so jaggedes that they cannot be drawn out. Fore lock bolts hath an eye at the end, wherelnto a Forelock of iron is driven to keepe it from starting back. Fend bolts are beat into the outside of a Ship, with the long head to save her sides from galling against other ships. Drive bolts is a long piece of iron to drive out a Tree naile, or any such

Planks.

Beames.
Dylop.

Riders.

Knées.

Ports.

Beds.

Ring bolts.

Set bolts.

Clinch bolts.

Rag bolts.

Forelock bolts.

Fend bolts.

Drive bolts.

She was built
of Cedars

such things, besides divers others so usefull that without them
and long iron spikes and nails nothing can be well done;
yet, I have known a ship built, hath sailed to and again over
the main Ocean, which had not so much as a nail of iron
in her, but onely one bolt in her keel.

Clamps.

Now your risings are above the first Orlop as the Clamps
are under it, which is long thick planks like them, fore and
aft on both sides, under the ends of the Beams and Timbers
of the second Deck or Orlop, or the third Deck or Orlop, or
the third Deck which is never called by the name of Orlop,
and yet they are all but Decks; also the half Deck and
quarter Deck, whereon the Beams and Timbers bear are
called risings. A flush Deck is when from Stern to Stern, it
lies upon a right line fore & aft which is the best for a Part of
War, both for the men to help and succour one another, as for
the using of their arms, or remounting any dismounted Piece,
because all the Ports on that Deck are on equall height,
which cannot be without beds and much trouble, where the
Deck doth camber or lie compassing. To sink a Deck is
to lay it lower, to raise a Deck to put it higher, but have
a care you so cut your Port holes, one piece lie not right over
another for the better bringing them to your mark.

Deck.
A halfe Deck.
A quarter Deck.
A flush Deck.

A Cambered
Deck
To sink a Deck
To raise a Deck

The half Deck is from the main Mast to the Stéerage,
and the quarter Deck from that to the Masters Cabin called
the Round House, which is the utmost of all, but you
must understand all those Works are brought up together, as
néere equally as may be from bend to bend, or waile to
waile, which are the outmost timbers on the ship sides, and
are the chiefe strength of her sides, to which the foot-hooks,
beams and knees, are bolted, and are called the first, second,
and third Bend; but the chaine waile is a broad timber set
cut amongst them, a little above where the chaines and
brazons are fastned together, to spread the brazons the
wider, the better to succour the masts. Thus the sides
and Decks are wrought till you come at the Gunwaile,
which is the upmost waile goeth about the upmost fraise or
seame of the upmost Deck about the ships waile, & the ships
quarter is from the main mast aftward.

Bend, or waile

Chain waile.

Gun waile.

The ships
quarter is.

Cul-

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Culvertailed is letting one timber into another, in such sort that they cannot slip out, as the Carling ends are fixed in the beams, and Carlings are certain timbers lieth along the Ship from beam to beam, on those the ledges doe rest, whereunto the planks of the Decks are fastened. The Carling knees are also timbers comes thwart the Ship from the sides of the Hatches way, betwixt the two Masts, and bears up the Deck on both sides, and on their ends lieth the commings of the Hatches, which are those Timbers and planks which bears them up higher than the Decks, to keepe the water from running down at the hatches; also they fit Loopholes in them for the close sights, and they are likewise a great ease for men to stand upright if the Decks be low. The Hatches way is when they are open where the goods are lowered that way right down into the howle, and the Hatches are like Trap doores in the midst of the Decks, before the Main mast, by certain rings, to take up or lay down at your pleasure.

Culvertailed,
Carlings.

Carling knees.

Commings.

Loopholes.

Hatches way.

A Scuttle hatch is a little hatch doth cover a little square hole we call the Scuttle, where but one man alone can go down into the Ship, there are in others places of the Ship whereby men passe from Deck to Deck, and there is also small Scuttles grated, to give light to them betwixt Decks, and for the smoke of Ordnances to passe away by. The Ramshhead is a great block wherein is three thibers into which are passed the halvyards, and at the end of it in a hole is reved the ties, and this is only belonging to the fore and main halvyard; to this belong the fore Knight, and the main Knight, upon the second Deck fast bolted to the Beames. They are two short thick peeces of wood, commonly carbed with the head of a man upon them, in those are four thibers apiece, three for the halvyards, and one for the top rope to run in; and Knevcls are small peeces of wood nailed to the inside of the Ship, to belay the Sheets and Racks unto.

A Scuttle.

Ramshhead.

The fore
Knight,
The main
Knight.

Knevcls.

Capstaine.

The Capstaine is a great pece of wood stands upright upon the Deck, abast the main mast, the foot standing in a step upon

Capstain bars.

The Spindle.
Whelps.

Paul.

Jeare Capstain

The Viol.

A Windas.

The Pump.

The Brake.
The Can.
The Daile.

Chained
Pumps.

A Bar Pump.

upon the lower deck, and is in the nature of a windis, to winde or weigh up the Anchors, Sails, Top-masts, Ordnance, or any thing, it is framed in divers squares, with holes thorow them, thorow which you put your Capstain bars, for as many men as can stand at them to thrust it about, and is called manning the Capstain. The main body of it is called the Spindle. The Whelps are short pieces of wood made fast to it, to keepe the Cable from coming too high in the turning about. The Paul is a short piece of iron made fast to the Deck, resting upon the whelps to keepe the Capstain from recoiling, which is dangerous, but in great Ships they have two, the other standing in the same manner betwixt the fore mast and the main, to heave upon the Jeare rope, and is called the Jeare Capstain, to strain any Rope, or hold off by, when we way anchor, to heave a head, or upon the Tiall, which is when an Anchor is in the ground we cannot weigh it, or the Sea goeth so high the main Capstain cannot purchase in the Cable, then we take a Hawser opening one end, and so puts into it Rippers some seven or eight some distant from each other, wherewith we binde the Hawser to the Cable, and so brings it to the Jeare Capstain to heave upon it, and this will purchase more than the main Capstain can. The Viol is fastened together at both ends with an eye or two, with a wall knot, and sealed together. A Windas is a square piece of timber like a Role before the fore Castle in small Ships, and forced about with handspikes, for the same use as is the Capstain.

What are the parts of a Pump you may see in every place, the hand'e we call the Brake, the Pumps Can is a great Can we powder water into Pumps to make it pump. The Dasse is a Trough wherein the water doth run over the Docks: But in great Ships they use chained Pumps which will go with more ease, and deliver more water. The Dutch men use a Burre pump by the Ship side, wherein is only a long stasse with a Burre at the end, like a Gunners sponge, to pump up the Well age water, that by reason of the breadth of the Ships staze cannot come to the Well: In pumping

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puffing they use to take spels, that is, fresh men to relieve them, and count by how many strokes they pumpe each watch, whereby they know if the ship be stanch, or tight, or how her leakes increase. The pumpe sucks, is when the water being out, it drawes up nothing but froth and winde. They have also a little pumpe made of a Cane, a little piece of hollow wood or Latten like an Elder gun, to pumpe the Beere or Water out of the Caske, for at Sea we use no Taps, and then stave the Caske to make more room, and packeth the pumpe-staves or boords up as close as may be in other Caske till they use them.

The Pumpe
suck.

A bare-Pump.

The Skuppers are little holes close to all the Decks thorough the Ships sides, whereat the water both runne out when you pumpe or wash the Decks; the Skupper-leathers are nailed over those holes upon the lower Deck to keep out the Sea from comming in, yet give they way for it to runne out: Skupper-nailes are little short ones with broad heads, made purposely to naile the Skupper-leathers, and the ropes of Galls and Pumps. The Waist is that part of the Ship betwixt the main Mast and the fore-castle, and the Waist boords are set up in the Ships waist, betwixt the Gun-waile and the waist trees, but they are most used in Boats, set up alongst their sides to keep the Sea from breaking in.

The Skuppers

Skupper-lea-
thers.

Skupper-nailes.

The Waist.

Waist boords.

Waist trees.

There are usually three Ladders in a Ship: the entering Ladder is in the Waist, made formally of wood, and another out of the Gallery made of Ropes to go into the boat by in foule weather, and the third at the Beak-head, made fast over the Boulspret to get upon it, onely used in great Ships.

The entering
Ladder.

Gallery
Ladder.
Boulspret
Ladder.

It were not amiss now to remember the Fore-castle, being as usefull a place as the rest, this is the foremost part of the Ship above the Decks over the Bowe, there is a broad Bowe and a narrow bow, so called according to the broadnes or the thinnesse: the Bowe is the broadest part of the Ship before, compassing the Stem to the Rouse, which reacheth so farre as the Bulk-head of the Fore-castle extendeth. Against the

The Fore-
castle.

Bowe.

Rouse.

Cut a feather.

Booke is the first breach of the Sea, if the Booke be too broad, she will seldeome carry a booke in her mouth or cut a feather, that is to make a some before her: where a well hoined ship so swiftly presseth the water, as that it foameth, and in the dark night sparkleth like fire. If the Booke be too narrow, as before is said, she pitcheth her head into the Sea, so that the meane is the best if her after-way be answerable. The

Hauses.

Hauses are those great round holes before, under the Beak-head, where commonly is used the Castles when you come to an Anchor, the bold or high Hause is the best, for when they lie low in any great sea, they will take in very much water, the which to keep out, they build a circle of planks either abaft or before the maine Mast called the Darger: and a Hause-plug at Sea, now the fore-castle doth cover all those being built up like a halfe decke, to which is fixed the Beak-head, and the prow is the Decke abaft the fore-castle, whereon lieth the Prow pieces.

Prow.

The beak-head.

The Beak-head is without the ship before the fore-Castle, supported by the maine knee, fastened into the stem, all painted and tarbed as the Sterne, and of great use, as well for the grace and countenances of the ship, as a place for men to easo themselves in. To it is fastened the roller of the maine stay, and the fore-tacks there brought aboard; also the standing for rigging and trimming the sprits-salle gear, under the midst of it is the Combe, which is a little piece of wood with two holes in it to bring the fore-tacks aboard. The bits are two great pieces of timber, and the Crosspeere goeth thorow them, they are ordinarily placed abaft the Darger in the ships lowe, to delay the Cable thereto when you rise at Anchor: Their lower parts are fastened to the Ribers, but the middle part in great ships are bolted to two great beames cross to the Bolers, and yet in extraordinary shoimes we are glad to make fast the Cable to the maine Mast for strengthening of the bits and stay of the Bolers, which have in great shoimes been torn from the ships. The David is a short peece of timber at the end whereof in a notch they hang a block in a ring called the

Combe.

Bits.

Crosspeere.

David.

Fifth.

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II

With-block, by which they hale up the flack of the Anchor to the Ships botom, it is put out betwixt the Cat and the Louse, and to be removed when you please. The Cat is also a short piece of timber aloft right over the Main'e; in the end it hath two thibers in a block, wherein is reeved a Rope, to which is fastened a great hook of Iron, to strice up the Anchor from the Hatch to the top of the fore-castle.

A Bulke head is like a seeling or a wall of boards thwart the Ship, as the Gun-room, the great Cabin, the bread-room, the quarter Decke, or any other such division: but them which doth make close the fore-castle, and the halfe Decke, the Mariners call the Cabbridge heads, wherein are placed murderers, and abast Falcons, Falconets, or Robins to cleave the Decks fore and aft so well as upon the Ships sides, to defend the Ship and offend an enemy. Sockets are the holes wherein the pintels of the murderers or soldiers go into. The hollow reaching betwixt the lower part of the Gallery and the Transome, is called the lower Counter; the upper Counter is from the Gallery to the arch of the round house, and the brackets are little carbed knees to support the Galleries.

The Stearage come, is before the great Cabin, where he that steareth the Ship doth alwayes stand, before him is a square box nailed together with wooden pines, called a Bittacle, because iron nailes would attract the Compasse; this is built so close, that the Lamp or Candle only sheweth light to the Stearage, and in it alwayes stands the Compasse, which every one knowes is a round box, and in the midst of the bottom a sharp pin called a Centre whereon the Fly doth play, which is a round peece of yce-wood, with a small taper under it touched with the Load-stone, in the midst of it is a little brasse Cap that doth keep it beell upon the Centre. On the upper part is painted 32 points of the Compasse covered with glasse to keep it from dust, breaking, or the winde; this Box doth hang in two or three brasse circles, so fixed they give such way to the moving of the Ship that still the Box will stand steady: there is also a dark Cam-

Fish block.

Cat.

A Bulkes head

Cubbridge head.

Sockets.

Low Counter.
Upper Counter

Brackets.

The Stearage.
Great Cabin.

Bittacle.
The compasse.

A dark Com-
passe.

A Compasse
for Variation.

The Trava.

The Whip-
staffe.

The Rowle.

The Tiller.
Rudder.

Pintels.
Gudgeons or
Rudder Irons.

The Gun-
room.

Cabin.

Lockers.

The bread

room.

Cook-room.

Steele.

passé, and a Compasse for the variation, yet they are but as the other, onely the dark Compasse hath the points blacke and white, and the other onely touched for the true North and South. Upon the Bittacle is also the Trava, which is a little round board full of holes upon lines like the Compasse; up in which by the removing of a little stick they keep an account, how many glasses (which are but half hours) they stand upon every point. The Whip-staffe is that piece of wood like a strong staffe the Steersman or Helmesman hath alwayes in his hand, going the row the Rowle, and then made fast to the Tiller with a Ring.

The Tiller is a strong piece of wood made fast to the Rudder, which is a great timber somewhat like a plank, made according to the burthen of the ship, and hung at the stern upon hokes and hinges, they call Pintels and Gudgeons, or Rudder-irons. The Tiller playeth in the Gun-room over the Ordnances by the Whip-staffe, whereby the Rudder is so turned to and fro as the Helmesman pleaseth, and the Gun-holes are over the Ports, right with the Captain as they can, to heave the Ship a sterne by a Cable or a Hauler called a sterne-fast. On each side the Steerage-rame are others Cabine, as also in the great Cabin, the quarter Decke, and the round house, with many convenient seats or Lockers to put any thing in, as in little Cupbets.

The Bread-roume is commonly under the Gun-roume, well dried or plated. The Cook-roume where they dresse their victuall may be placed in others places of the ship, as sometimes in the Hold, but that oft spoileth the victuall by reason of the heat, but commonly in Merchantmen it is the Fore-castle, especially being contrived in Fornaces; besides in chase their sterne is that part of the ship they most use in fight, but in a man of warre they fight most with their prow, and it is very troublesome to the use of his Ordnance, and very dangerous lying over the Powder-roume, some doe place it over the Hatches way, but that as the Steewards roume are ever to be contrived according to

to the Ships Imploiment, &c. Calking is beating Okum into every seam; betwixt plank and plank and Okum is a Ropes torn in pieces like Towse Patch, or Bits of Flax, which being close beat into every seam with a calking Iron and a Pellet, which is a hammer of wood and an Iron chissell, being well payed over with hot pitch, both make her more tight than it is possible by joining Plank to Plank. Graving is one's under water, a white mixture of Tallow, Soap and Blunstone; or Train-oil, Resin, and Blunstone boiled together, is the best to preserve her calking and make her glib or slippery to passe the water; and when it is decayed by weeds, or Barnacles, which is a kind of fish like a long red worm, will eat the row all the planks if she be not sheathed, which is as calking the Hull under water with Tar, and Hair, close covered over with thin boards fast nailed to the Hull, which though the Olozin pierce, she cannot endure the Tar. Breaming her, is hot washing or burning of all the sides with reeds or bream, either in a dry dock or upon her Carrack, which is, to make her so light as you may bring her to lie on the one side so much as may be in the calm & water you can, but take heed you overset her not; and this is the best way to Bream Ships of great burthen; as those have but 4 sharp Flozes for fear of bruising or oversetting. Parsling is most used upon the Decks and halfe Decks; which is, to take a list of Cantras so long as the seam is you would percell, being first well calked, then powre hot pitch upon it, and it will keep out the water from passing the seams. There remains nothing now as I can remember to the building the Hull of the Ship, nor the definition of her most proper termes, but onely seeing the Cabins and such other parts as you please, and to binde an end with all things fitting for the Sea, as you may reade in the Covenants betwixt the Carpenter and the Owner, which are thus.

If you would have a Ship built of 400 Tuns, she requires a plank of 4 inches: If 300 Tuns, 3 inches: small Ships 2 inches, but none lesse. For clamps, middle bands and flæ-

Calking.
Okum.

Calking Iron.
Paying.

Graving.

Barnacles,
or Wormes.

Brooming or
Breaming.
Careene.

Parsling.

pers, they be all of six inch plank for binding within. The
 rest for the spring up of the works of square three inch
 plank. Lay the beams of the Dvlope, if she be 400 Tons
 at ten foot deep in holle, and all the beames to be bound
 with two knees at each end, and a stardard knee at every
 beames end upon the Dvlope, all the Dvlope to be laid with
 square three inch plank, and all the planks to be tre-nalled
 to the beames.

Six foot would be between the beames of the Deck and
 Dvlope, and ten ports on each side upon the lower Dvlope,
 all the binding between them should be with three inch or
 two inch plank, and the upper Decke should be laid with
 so many beames as are sitting with knees to binde them;
 laying that Decke with spruce Deal of thirty foot long,
 the sap cut off, and two inches thick, for it is better then any
 other.

Then for the Captains Cabben or great Cabben, the
 Stearage, the half Decke, the Rains house, the Fore-castle,
 and to binde an end with the Capstern and all things sitting
 for the Sea, the Smiths work, the carbing, joinning, and
 painting excepted, are the principall things I remember to
 be observed: for a Charter-party betwixt the Merchant, the
 Master, and the Owner, you have presidents of all sorts
 in most Seordensers shops.

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CHAP. III.

How to proportion the Masts and Yards for a Ship, by her Beam and Keel.

When a ship is built, she should be masted, where-
in is a great deal of experience to be used so well
an art; for if you overmast her, either in length
or bignesse, she will lie too much down by a
wind, and labour too much a hull, and that is called a Taunt-
mast, but if either too small or too short, she is under masted
or low masted, and cannot bear so great a sail as should grow
her her true way. For a mast of waire, a well ordered
Taunt-mast is best, but for a long voyage, a short Mast will
bear more Canvass, and is less subject to beat by the board:
Their Rules are divers, because no Artist can build a Ship
so truly to proportion, neither set her Masts, but by the trial
of her condition, they may be impaired or amended: sup-
pose a Ship of 300 Tunnels be 29 foot at the Beam, if her
maine Mast be 24 inches diameter, the length of it must be
34 yards, for every inch in thickness is allowed a yard in
length, and the fore-Mast 22 inches in thickness, must be
22 yards in length; your Bowle-Spel both in length and
thickness must be equal to the fore-Mast, the Mizen 17 yards
in length, and 17 inches diameter.

But the Rule most used is to take the parts of the
breadth of the Ship, and multiply that by three, will give
you so many foot as your maine Mast should be in length, the
bignesse or thickness will bear it also, allowing an inch for
every yard. But if it be a made Mast, that is greater than one
Tree, it must be more: for example, suppose the Ship's
breadth 30 foot, four fifths of 30 foot are 24 foot, so you since
the maine Mast must be 24 yards long, for every yard is
3 foot and 24 inches thorow, allowing an inch to every
yard,

A Ship over-
masted.

Taunt masted.
Under-masted.

An example.

The rule most
used.

A made Mast,
or an arme
Mast.

yard. The fore Mast is to be in length $\frac{1}{2}$ of the maine Mast, which will be 20 yards wanting one $\frac{1}{2}$ part of a yard, and 20 inches thereof. The Boutsprit must ever be equall with the fore Mast. The maine Mast ha's the length of the maine Mast, which will be 12 yards long, and 12 inches diameter. Now as you take the proportion of the Masts from the Beam or breadth of the Ship, so do you the length of the yards from the keele.

The Steps.
Partners.

These Masts have each their steps in the Ship, and their partners at every Decke, where-thorow they passe to the keele being strong timbers bolted to the Beams in circling the Masts, to keep them steady in their steps fast wedged for rolling; yet some ships will not sail so well as when it doth play a little, but that is very dangerous in foule weather. Their Cotes are pieces of tarred Canvas, or a Tarpawling put about them and the Rudder to keep the water out. At the top of the fore Mast and maine Mast are spliced cheeks, or thick clamps of wood, thorow which are in each two holes called the Hounds, wherein the Ropes do run to holse the yards, but the top Mast hath but one hole, or Hound, and one eye. Every mast also hath a Cap at a top; which is a piece of square timber with a round hole in it to receive the top Masts or flag-staffe, to keep them steady and strong, lest they be born by the board in a stiff gale. The Crosse-trees are also at the head of the Mast, one let into another crosse, and strongly bolted with the Tressell trees, to keep up the top Masts which are fastened in them, and those are at the tops of each Mast; all the Masts stand upright but the Boutsprit which lyeth along over the Beak-head, and that timber it resteth on is called the Pillow.

Cotes.
Tarpawling.

Checks.

The Hounds.

The Cap.

Crosse-trees.

Tressell-trees.

Follow.
An example of
the Yards by
the keele.

Now for the yards, suppose the ship be 76 feet at the keele, her maine yard must be 22 yards in length, and in thickness but 17 inches. The fore Yard 19 yards long, and 15 inches diameter or thick. The sprit-salle Yard 16 yards long, and but nine inches thick, and your Gisen-yard so long as the Mast, the top yards bear a halfe proportion to the maine, and fore yard, and the top gallants, the halfe to them,

Now, but this rule is not absolute, for if your masts be scant your yards must be the shorter: if a low mast the longer, but this is supposed the best. To hate the main Yard parts of her keele in length: the top Yard, of the main Yard: and the main Yard for bignesse: parts of an inch, for a yard in length. The length of the fore Yard $\frac{1}{4}$ of the main Yard: the crossejack Yard and Spritsail Yard to be of a length, but you must allow the Spilen Yard and Spritsail Yard, inch of thicknesse for a yard in length. But to give a true Arithmetickall and Geometrickall proportion for the building of all sorts of Ships, were they all built after one mould, as also of their Masts, Yards, Cables, Cordage, and Ropes, were all the Ruffe of this gunnesse, a methodicall rule as you see might be proposed: but these lengths, breadths, depths, rakes and burdens are so variable and different, that nothing but experience can possibly teach it.

CHAP. IV.

The names of all the Masts, Tops, and Yards belonging to a Ship.

The Boni-spill, the Spritsail Yard, the Spritsail top-mast, the Spritsail top-sail yard: the fore-mast, the fore yard, the fore top-mast, the fore top-sail yard, the fore top gallant mast, the fore top gallant saille yard, Cotes, woulings, Gromits, and Deaples for all yards. The main mast, the main Yard, the main Top. The main top mast, the main top-sail Yard. The top gallant mast, the main top gallant saille Yard. The Trucke is a square piece of wood at the top, wherein you put the Flag-staffe. The Spilen, the Spilen Yard, the Spilen top mast, the Spilen top sail Yard. The Crosse Jack. In great Ships they have two mizens, the latter is called the Bonaventure spilen.

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A **Jury Mast**, that is, when a Mast is torn by the blow with Waves, Ropes, Trees, or what they can, spliced or stitched together they make a Jury mast, mending or binding them with ropes fast striced together with band-splines, as they use to mende any Mast or Yard in such cases.

When a Ship is in such a case, they will not go to sea, but will stay in port till they can mend the Mast or Yard.

GAAP. V.
How all the Tackling and Rigging of a Ship is made fast one to another, with their names, and the reasons of their use.

The rigging a Ship, is all the Ropes or Cordage belonging to the Masts and Yards; and it is proper to say, The mast is well rigged, or the yard is well rigged, that is, when all the Ropes are well fitted to a true proportion of her burthen. We say also, when they are too many or too great, she is over-rigged, and both much wrong a Ship in her sailing; for a small weight aloft, is much more in that nature than a much greater below, and the more upright any Ship goeth, the better she saileth.

All the Masts, Top masts, and Flag masts have Stays, excepting the Sprit sail top mast, the maine mast stay is made fast by a Lannier to a Coller, which is a great Rope that comes about the head and Boultsprit, the other end to the head of the maine mast. The main top Mast stay is fastened to the head of the fore-mast by a Drop and a dead mans eye. The main top-gallant Mast stay in like manner to the head of the fore top Mast. The fore Masts and Stays belong ing to them in like manner are fastened to the Boultsprit, and Sprit all top Mast, and those Stays do help to stay the Boultsprit. The Gaffen Stays do come to the maine mast, and the Gaffen top mast stays to the Mizonns with Crowes feet: the use of those Stays are to keep the masts from falling aftwards, or too much so: wards. Those Lanniers are many small Ropes reben into the dead mens eyes of all Mizonns,

Rigging or Cordage.

A Mast well rigged.

A Yard well rigged.

Over rigged.

All Masts have stays except one.

A Coller.

A Lannier.

Dead mens eyes.

Crowes-feet.

...also all the
...Dead mens eyes &c. blocks, some small, some great, with
many holes but no others, the Crowes-feet &c. these
they are a kind of small lines, sometimes 6, 8 or 10 but of
small use more than for fashion to make the ship look full
of small Ropes. Blocks or Pulleys are thick pieces of wood
having Shivers in them, which is a little wheele fixed in
the middle with a Cork or Pin, some are brasse, but the
most of wood, whereon all the running Ropes do run, some
are little, some great, with 3, 4 or 5 Shivers in them, and
are called by the names of the Ropes whereof they serve.
There are also double blocks, that where there is use of
much strength will purchase with much ease, but not so fast
as the other, and when we hale any Wackie or Balepard so
which two blocks do belong, when they meet, we call that
block and block.

The Shrouds are great Ropes which go up either sides of
all masts. The main mast and fore mast shrouds have
at their lower ends dead mens eyes fasten into them, and
are set up taught by 2 anniers to the chaines; at the other
end, over the heads of these masts are pendants for Wackels
and Shrouds under them. The top masts shrouds in like
manner are fastened with 2 anniers and dead mens eyes to
the puttocks or plates of iron belonging to them, aloft over
the head of the mast as the other; and the Chaines are
strong plates of iron fast bolted into the ships side by the
Chain-plate. When the Shrouds are too loose, we say,
ease them, when too slacke, we say, let taught the shrouds,
but the Waulstper hath no Shrouds, and all these small
ropes to cross the Shrouds like Steps are called Ratlings.
The puttocks go from the Shrouds of the fore mast, main
mast or mizen, to go off from the Shrouds into the Top,
Cap, or Botal, which is a round thing at the head of either
mast for men to stand in, for when the Shrouds come near
the top of the mast, they fall in so much, that without the
puttocks you could not get into the Top, and in a manner
they

Blocks or
Pulleys.
Shivers.
A Cocke.
Running ropes

Double blocks.

Block and
block.

All masts have
Shrouds &c.

Chaines.

To ease.
Taught.
Ratlings.
Puttocks.

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they are a kind of a shroud. A pendant is a short rope made fast at one end to the head of the mast or the yards arm, having at the other end a block with a shrook to receive some running rope in, as the pendants of the back stales and Tackles hang a little down on the inside of the shrouds; all yards arms have them but the gaffen, into which the braces are reeved and also there are pendants of streamers hang from the yards arms, made of Taffaty, or coloured small cloth to beautify the ship onely: Barrels are little round Bells called Trucks, and little pieces of wood called ribs; and ropes which do incircle the masts, and so made fast to the yards, that the yards may slip up and down easily upon the masts, and with the help of the breast-rope both keep the yard close to the mast. The standing ropes are the shrouds and stales, because they are not removed, except it be to be eased or let tauter.

The Tackles or ropes run in three parts, having a Pendant with a block at the one end, and a block with a shrook at the other, to heave any thing in or out of the ship; they are of divers sorts, as the Bores tackles made fast the one to the fore shrouds, the other to the main, to hoise the Boat in or out: also the tackles that keep firm the masts from straying. The Gunners tackles for hauling in or out the Ordnances: but the winding tackle is the greatest; which is a great double block with three shivers to the end of a small Cable about the head of the mast, and serveth as a Pendant. To which is made fast a Guy, which is a rope brought to it from the fore mast, to keep the weight upon it strain, or from sliding to and again: Into the block is reeved a halwiser, which is also reeved thro' another double block, having a stop at the end of it, which put thro' the eye of the rings is locked into it with a pin, and so hoise the goods in or out by the help of the Snay-block.

Cat harpings are small ropes run in little blockes from one side of the ship to the other, near the upper deck to keep the shrouds tight for the more safety of the mast from rotting. The Halpards be long to all masts, for by them we

hoise

Parted.

Ribs.

Breast-ropes.
Standing
ropes.The Tackles
are of divers
sorts, &c.

A-Guy.

Cat harpings.

Halpards.

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hoise the yards to their height, and the Ties are the ropes The Ties.
by which the yards do hang, and do carry up the yards when
we strain the Helpeers; the maine yard and fore yard ties
are first fixed through the Runns head, then through the
Boulds, with a turn in the eye of the slings which are made
fast to the yard; the mizen yard and top yard have but single
ties, that is, one both but run in one part, but the Sprit-
sail yard hath none, for it is made fast with a paire of slings
to the boltsprit. A horse is a rope made fast to the fore mast
boulds, and the Spritsail boulds, to keep those boulds clear
of the anchor stokes.

A Horse.

To sling is to make fast any cask, yard, ordnances, or
the like in a paire of Slings, and Slings are made of a rope
splited at either end into it selfe with one eye at either end,
so long as to be sufficient to receive the cask, the middle
part of the rope also they seaze together, and so maketh ano-
ther eye to hitch the hook of the tackle, another sort are made
much longer for the hoisting of ordnances, another is a chain
of iron to sling ordnance the yards fast aloft to the crowe
trees in a light, lest the tie shon'd be cut, and so the mast
must fall. The Canhookes are two hookes fastened to the
end of a rope with a nose, like this the Brewers use to
sling ordnance their barrells on, and those serve also to take in
ordnance hogheads or any other commodities. A Parbunkel is
two ropes that have at each end a nose or lump that being
crossed, you may set any vessell that hath but one head upon
them, bringing but the lopes over the upper end of the cask, fix
but the tackle to them, and then the vessell will stand straight
in the midst to heave out, or take in without splitting.

To Sling.
Slings.

Canhookes.

A Parbunkel

Puddings are ropes nailed round to the yards arms close to
the end, a pretty distance one from another, to save the Rob-
bins from galling upon the yards, or to serve the anchors ring
to save the clinch of the cable from galling. And the Rob-
bins are little lines reeved into the eyel holes of the sail un-
der the head ropes, to make fast the sail to the yard, for in
stead of tying, sea men alwayes say, make fast. Head lines,
are the ropes that make all the sails fast to the yard.

Puddings.

Robbins.

Head lines.

Furling

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Furling lines.

A smiting line.

Braks.

Creegles.

Bolt ropes.

Bunt lines.

Clew Garnet.

Clew line.

A Clew.

Gooring.

Tackes.

Shears.

Braces.

Furling lines are small lines that fall to the top sail, top gallant sail, and the mizen yards arms. The mizen hath but one called the smiting line, the other on each side one, and by these we furlbell or bunt up the sails. The Braks are small ropes reeved throught blocks seated on each side the flies, and come down before the mast, and at the very skirt are fastened to the Creegles. With them we furl or furlbell our sails across, and they belong onely to the two courses and the mizen: to hale up the Bales, or bale up the sail, is all one. Creegles are little ropes spliced into the Bolt-ropes of all sails belonging to the maine and fore mast, to which the bolting bites are made fast, and to hale by when we make off a Bonnet.

Boltropes is that rope is lashed about every sail, soft and gently twisted, for the better following and handling the sails. Bunt lines is but a small rope made fast to the middle of the boltrope to a triangle reeved throught a small blocke which is seated to the yard, to trize or bunt up the bunt of the sail. When you furlbell or make it up. The Clew garnet is a rope made fast to the clew of the sail, and from thence runnes in a block seated to the middle of the yard, which in furling hath hale up the clew of the sail close to the middle of the yard, and the clew line is the same to the top sails top gallant and sprit sails, as the Clew garnet is to the maine and foresails. The Clew of a sail is the lower corner next the Sheat and Tackes, and stretcheth somewhat gooring or sloping from the square of the sail, and according to the Gooring she is fast to spread a great or a little clew. Tackes are great ropes which having a wall-knot at one end seated into the clew of the sail, and so reeved first throught the chestres, and then cometh in at a hole in the ships sides, this hath carry forward the clew of the sail to make it stand close by a wind. The Sheats are bent to the clews of all sails, in the lower sails they hale all the home, that is, to bring the clew close to the yards arms. The Braces belong to all yards but the mizen, every yard hath

both two ropes at their ends thro' the two pendants, and
tho' are to square the yards, or truss them as you please.
The boling is made fast to the litch of the sails about the
middle to make it stand the sharper or closer by a winde. It is
fastened by two, three, or four ropes like a cross fast to as
many parts of the sails which is called the boling bridle,
onely the mizen boling is fastened to the lower end of the
yard, this rope belongs to all sails except the Sprit-sail,
and Sprit-sail Top-sail, which not having any place to
hale it forward by, they cannot use those sails by a winde.
Sharp the prime boling is to haul it taught; hale up the boling
is to pull it harder forward on; check or ease the Boling
is to let it be more slack.

Boling.

Boling bridle.

Sharp the Bo-
ling.

Check the
Boling.

Lee fannings
Reaving.

Leech lines.

Leech of a
sail.

Earrings.

Bent.
Lifts.

Topping the
Lifts.
Legs.

Martnet.

A lee fanning is a rope riced into the cringles of the cour-
ses, when we would hale in the bottom of the sail, to lash
on a bonnet or take in the sail; and reaving is but drawing
a rope thro' a block or oyle to runke up and down. A leech
line is a small rope made fast to the Leech of the top-sails,
for they belong to no other; and are riced into a block
at the yard clew by the top-sails clew, to hale in the Leech of
the sail when you take them in. The Leech of a sail is the
outward side of a skirt of a sail, from the earing to the clew,
and the Earing is that part of the bunt rope which at all the
four corners of the sail is left open as it were a ring. The
two uppermost parts are put over the ends of the yards arms,
and so made fast to the yards, and the lowermost are seized
or bent to the sheets, and tacked into the clew. The Lifts
are two ropes which belong to all yards run, to top the
yards; that is, to make them hang higher or lower at your
pleasure. But the top-sail Lifts do serve for sheets to the
top-gallant yards, the hauling them is called the topping the
Lifts, or top a Sheeters, or top a post.

Legs are small ropes put thro' the butt ropes of the
main and fore sail, near to a foot in length, spliced each end
into the other in the Leech of the sail, having a little eye
whereunto the martnets are fastened by two hitches, and
the end seized into the standing parts of the martnet, which

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Latches.

Lashing.

The Loose
hook.

Boule.

A Bonnet.

A Drabler.

A course.

A Knave line.

Kacuck.

Rope yarnes.

Sinnet.

Mans or Panch

are also small lines like xrain set railed thow a block at the top mast head, and so comes down by the mast to the deck; but the top-sail martnets are made fast to the head of the topgall mast, and cometh but to the top, where it is haled and called the top martnets, they serve to bring that part of the Latch next the yards arm up close to the yard. Latches are small lines solved in the Bonnets and Drablers like lops to lash or make fast the Bonnet to the course, or the course to the Drabler, which we call lashing the Bonnet to the course, or the Drabler to the Bonnet. The Loose hook is a tackle with two hooks, one to hitch into a chingle of the main, or fore sail, in the belt rope in the larch of the sail by the clew, and the other to strap spliced to the chestres to boule or pull down the sail to succour the tacks in a stiff gale of wind, or take off or put on a Bonnet or a Drabler, which are two short sails to take off or put to the fore course or the main, which is the fore sail, or main sail.

The Knave-line is a rope hath one end fastened to the cross trees, and so comes down by the ties to the Rams head, to which is sealed a small piece of wood some two foot long with a hole in the end, wherunto the line is tacked, and brought to the ships keel, and haled taught to the Mastles to keep the ties and Hal yards from turning about one another when they are new. Knettels are two rope yarnes twisted together, and a knot at each end, wherunto to seale a block, a rope, or the like. Rope yarnes are the yarnes of any rope untwisted, they serve to seale small ropes, or make Sinnet, Spats, Plats, or Caburnes, and make up the sails at the yards arms.

Sinnet is a string made of rope yarne commonly of two, four, six, eight or nine strings platted in three parts, which being beat flat they use it to seale ropes or Spats. What which we call a Panch, are broad cloths, woven of Thurns and Sinnet together, to seale things from galling about the main and fore yards at the ties, and also from the masts, and upon the Boltspriet, Loure, Beake head or Gunwale to seale the clews of the sails from galling or fretting.

Caburn

Caburne is a small line made of spun yarne to make a bento of two Cables, or to seale the Wathels, or the like. Sealing is to binde fast any ropes together, with some small rope yarne. Marline is any line, to a block, or any Tackell, pendant, Garnet, or the like. There is also a rope by which the Boat doth ride by the Gips side, which we call a Heasen. To sarve any rope with plats or Sinnet, is but to lay Sinnet, Spun yarne, Rope yarne, or a piece of Canvas upon the rope, and then rowle it fast to keep the rope from galling about the shrouds of the head of the masts, the Cable in the Pulse, the hook of the Anchor, the boat rope or any thing. Spun yarne is nothing but rope yarne made small at the ends, and so spun one to another so long as you will with a winch. Also Caskets are but small ropes of Sinnet made fast to the gromets or rings upon the yards, the longest are in the midst of the yards betwixt the ties, and are called the best Caskets hanging on each side the yard in small lengths, only to binde up the sail when it is futed.

Marling is a small line of untwisted hemp, very pliant and well tasted, to seale the ends of Ropes from raveling out, or the sides of the blocks at their axes, or if the sail rent out of the Bolt rope, they will make it fast with marlin till they have let us to mend it. The marling spike, is but a small piece of iron to splice ropes together, or open the bolt rope when you sew the sail. Splicing is to let one ropes end into another, they shall be as strong as if they were but one rope, and this is called a round splice, but the cut splice is to let one into another with as much distance as you will, and yet be strong, and undo when you will. Now to make an end of this discourse with a knot, you are to know, Seamen use three, the first is called the Wall knot, which is a round knot, so made with the fronts or sides of a rope, it cannot slip, the Sheeters, Ties, and Stoppers use this knot. The Bolling knot is also so firmly made and fastened by the brailes in to the cringles of the sails, they will break, or the sail split before it will slip. The last is the Sheepshanks knot, which is a knot they cast them up in a running Tack when

Caburne.

Sealing.

Seasen.

Sarve or
Sirvis.

Spun yarne.

Caskets.

Marling.

Marling spike.

Splicing.

A round splice.

A cut splice.

A Knot.

A Wall knot.

A bolling knot.

Sheepshanks
Knot.

it is too long to take in the gods, and by this knot they can shorten a rope without cutting it, as much as they list, and presently undo it again, and yet never the worse.

CHAP. VI.

What doth belong to the Boats and Skiffe, with the definition of all those thirteen Ropes which are only properly called Ropes belonging to a ship and the Boat, and their use.

Of Boats there are divers sorts, but those belonging to ships, are called either the long Boat or Ships Boat, which should be able to weigh her sheet anchor, those will live in any reasonable sea, especially the long Boat; great ships have also other small boats called Challops and Skiffes, which are with more ease and lesse trouble rowed to and again upon any small occasion. To a boat belongs a mast and sail, a May boat and Halwart, Rudder and Rudder iron, as to a ship, also in any discovery they use a Tarpawling, which is a good piece of Canvas washed over with Tar, to cover the Bailes or hapes over the sterne of their boat, where they lodge in an harbour which is that you call a Tilt covered with leadmalt in point of berries; or else an Awning, which is but a le bote saile, or some piece of an old saile brought over the yerd and stay, and bannet out with the boat hake, so spread over their heads, which is also much used, as well a those as in a ship, especially in hot countreys to keep men from the extremity of heat or wet, which is very oft infectious. Thoughtes are the seats whereon the Rowers sit; and Thowles small pins put into little holes in the Gunwalle or upon the Boats side, against which they bear the oares when they row, they have also a Trub, and also in long boats

A long Boat.

A Shall p.
A Skiffe.

Tarpawling.
Bailes.

Awning.

Thoughts.
Thowles.

boats a hole to let the anchor by, which is still more ease than the ship can. The two arching timbers against the boat head are called Carlings. When the boat is to put a Gang of men, which is a company into her, they are commonly called the Coastwain Gang, who hath the charge of her. For the boat is to baste or cast out the water. When the boat is to help her flight. When the boat is to bring her head the other way. Hold water is to stay her. Forbear is to hold still any oar you are commanded, or on the board, or whole row. A fresh spell is to relieve the Rowers with another Gang, give the Boat more help for a part of the haul, who take Hauls, one and all, Haul, hea, hea, hea, hea, that is, they pull all strongly together.

The entering rope is tied by the ships side, to hold by as you go up the entering ladder, cleats, or ladders.

The Bucket rope that is tied to the Bucket by which you bale and draw water up by the ships side.

The Bolt ropes are those where the Gills are solved.

The Port ropes bale up the Ports of the Ordnances.

The Scare rope is a piece of a halser made fast to the maine yard, another to the fore yard close to the ties, reeved thorow a blocke which is seased close to the top, and so comes down by the mast, and is reeved thorow another blocke at the bottom of the mast close by the decke; great ships have on each side the ties one, but small ships none: the use is to help to hoist up the yard to succour the ties, which though they breake yet they would hold up the mast.

The Preventer rope is a little one seased cross over the ties, that if one part of them should break, yet the other should not runne thorow the Rams head to endanger the yard.

The top ropes are those where with we set or strike the maine or fore top masts, it is reeved thorow a great block seased under the Cap, reeved thorow the heel of the top mast thwart ships, and then made fast to a ring with a clinch on the other side the Cap, the other part comes down by the ties,

A Gang.
Free or Bail.
Trim Boat.
Wind: Boat.
Hold water.
Forbear.
A spell.

Vea, vca, vca.

The entering rope.

Bucket rope.

Bolt ropes.
Port ropes.

Scare rope.

Preventer rope.

Top ropes.

Keel ropes.

ties, raised into the mighths, and so brought to the Cap-
taine when they set the Top masts.

Rudder rope.

The Keel rope, you have read in the building, is of haine
in the keel to scower the timber holes.

Cat rope.

The Rudder rope is raised thow the stem post, and go-
eth thow the head of the Rudder, and then both ends
spliced together, serves to save the Rudder if it should be
struck off the irons.

Boy rope.

The Cat rope is to hale up the Cat.
The Boy rope is that which is tied to the boy by the one
end, and the anchors flooke by the other.

Boat rope.

The Boat rope is that which the ship doth tow her Boat
by, at her sterne.

Chest rope.

Shearing.

The Chest rope is added to the Boat rope when she is
towed at the ships sterne, to keep her from shearing, that is,
from splitting, and again; for in a stiff gale she will make
sure yalves, and have such gins, it would endanger her to
be torne in pieces, but that they use to stout her, that is, to
incirc'e the Gunwalle with a good rope, and to that make
fast the Chest rope.

Swifling.

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CAAP. VII

The names of all sorts of Anchors, Cables, and Sails, and how they bear their proportions, with their use: Also how the Ordnances should be placed, and the goods stowed in a ship.

The proper features belonging to Anchors are many: the least are called Kedgers, to use in calme weather in a slow stream, as to hedge up and down a narrow River; which is when they fear the winds, or else may drive them out more. They row by bet with an Anchor in a boat, and in the midst of the stream, or where they stand most still, the ship come to near the shore, and so by a halfter wind they head about, then weigh it again till the like occasion, and this is hedging. There is also a stream Anchor, not much bigger, to remain in a slow stream or tide. When there is the first, second, and third Anchor, yet all such as a ship in fair weather may ride by, and are called by two Anchors. The greatest is the great Anchor, and never used but in great need. They are commonly made according to the burthen of the ship by proportion, so that the great Anchor of a small ship will not serve for a Kedger to a great ship. Also it beareth a proportion in its shape, as the one fluke, which is that both strike in the ground, is but the third part of the shanke, in length; at the head of the shanke there is a hole called an eye, and in it a Ring, where in is the part to which there is fast fixed a Stocke of wood, as the flukes, and the length is taken from the length of the shanke. These differ not in shape but in weight; from two hundred, to three or four thousand weight. Grapels, or Couplings, are the least of all, and have four flukes but

A Kedger.

Stroame Anchor,
The first.
Second.
Third Anchor.
Sixth Anchor.

An Anchors
shanke.
Fluke.
Shoulder.
Beam or Nut.
Eye.
Ring.
Stocke.

bat no stork : for a boat to ride by, or to throw into a ship in a fight, to pull down the gratings or hold fast.

The Cables also carry a proportion to the Anchors, but if it be not three strouds, it is accounted but a Hawser, yet a great ship hath 1. maybe a Cap's to the Great Anchor for a small ship : and there is the first, second, and third Cable, besides the Shear Anchor Cable. If the Cable be well made, we say it is well laid. To heckell or tarpe the Cable, as is said, is but to lime some old cloths to keep it from galling in the Bitts or Ring. Splice a Cable, is to fasten two ends together, that it may be double in length, to make the ship ride with more ease, and is called a shot of Cable. Double a Cable, is to lay it up in a round Ring, or take one above another. Hay more Cable, is when you carry an Anchor out in the boat to turn over. Hay cheap, is when you offer let it, or turn it over half faster. There more Cable, is when you are at Anchor. And end for end is when the Cable runneth clear out of the Bitts, or any rope out of his Bitter. A Bight is to hold by any part of a rope, that is, the middle take. A bitter is but the turn of a Cable about the Bitts, and bears it out by little and little. And the Bitters run in that part of the Cable doth stay within board. Cert, is when the Cable is so taught that upon the turning of a tide, a ship cannot go over it.

To bend the Cable to the Anchor, is to make it fast to the Ring ; unbend the Cable, is but to take it away, which we usually do when we are at Sea, and to tie two ropes or Cables together is called bending. Hitch, is to catch hold of any thing with a rope to hold it fast, or with a hook, as hitch the fish-hook to the Anchor's fluke, or the Tackles flukes called Jukes hung over the ship's sides to keep them from hanging. In boats they use poles or boat-hooks to fend off the boat from hanging. A Brest-fast is a rope which is fastened to some part of the ship for wardon, to hold her head to a wharfe or any thing, and a Soterne-fast is the same in the Soterne. The use for the Hawser is to

lurp

A Cable, the first, second, and third.

Shear Anchor Cable.
Heckell.

Splice,

A shot of Cable.
Quoile.
A Fake.
Pay.
Pay cheap.
End for end.

A Bight.
A Bitter.

A Bitters end.
Cert.

To bend.
Unbend.

Bending.
Hitch.

Fenders.
Jukes.

Brest-fast.

Sotern fast.

the ship by which is laying out an anchor, and to unde-
 get up to it by a Capstan. Rounding is but pulling the flack-
 ends of any Cable with some hands into the ship. The
 Shank-painter is a short chain fastened under the fore masts
 through a hole in the ship's side, and at the other end a
 rope is made fast to the flack end to the Borne. A Stop is taken
 when you come to an Anchor, and heaves out your Cable, but by
 degrees till the ship ride well, then they say Stop the ship.
 The Cable and Anchors belong most pieces of wood
 called Bopes, or these shaped barrels like Bunbars as is
 said, but much shorter, to fasten your the Anchor and help to
 weigh it, there is another sort of Cables called Can Bopes
 much greater, moored upon Buntles to give Spindlers warning
 of the dangers.

The Main sail and the fore sail is called the fore course,
 and the Mizen one of a piece of course. Bonits and Drab-
 blers are commonly one third part a piece to the sail they be-
 long out in depth, but their proportion is uncertain; so
 some will make the main sail so deep, that with a shallow
 boom they will reach all the Mast without a Drabler, but
 without doubt we call them but courses; we say, lay on
 the boom to the course, because it is made fast with 3 catches
 into the eye of holes of the sail, as the Drabler is to it, and
 used as the wind permits. There is also your main top
 sail, and fore top-sail, with their top-gallant sails, and
 in a fair gale your Studding sails, which are built of Can-
 nasse, or any cloth that will hold water, are erected along
 the side of the main sail, and hoisted it out with a boom or
 long pole, which we use also sometimes to the clew of the
 main sail, fore sail, and sprit sail, when you go before the
 wind or quartering, the mizzen, your mizzen, and Gaff
 top-sail, your Sprit and Sprit top-sail, as the rest, take
 all their names of their parts. A Drift sail is onely used
 under water, heaved out right ahead by the rudder, to keep the
 ship's head right upon the sea in a storm, or when a ship
 is driven to fall in a current. A Netting sail is onely a sail
 laid over the Netting, which is small ropes from the top of
 the

Rouling.

Shank-painter.

Stop.

Boyes.

Can Boyes.

Sailes.

Main Sail.

Fore Sail.

Main course.

Fore course.

Bonits.

Drablers.

Main top Sail.

Fore top-Sail.

Top gallant

Sailes.

Studding sails.

Mizen.

Mizen top sail.

Sprit sail.

Sprit top-

Sail.

Drift Sail.

Netting Sail.

Netting.

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Vaist trees.
Roufe-tree's.

Stanchions.
Gratings.

Head Sailes.

After Sailes.

Leech.

The Clew.

Goring.

A Monke
seame.

A Round
seame.

A Tier,
Thi'd.
Second.

the fore castle to the poop, stretched upon the ledges from the Mast-trees to the Mast-trees, which are onely small Timbers to bear up the Gatings from the hault Decke to the fore-castle, supported by Stanchions that rest upon the halfe-Deck; and this setting of Gatings, which is but the like made of wood, you may see up & take down when you please, and is called the close lights fore and aft. Now the use of those sailes is this, all head sailes which are those belonging to the fore Mast and Bolt-sprit, do keep the ship from the wind or to sail off. All after sailes that are all the sailes belonging to the maine Mast and Mizzen keepes her to windward, therefore few ships will wear upon quarter-windes with one saile, but must have one after saile, and one head saile. The sailes are cut in proportion as the Masts and Yards are in breadth and length, but the Mizzen is in parts the depth of the fore saile, and the Mizzen by the Mizzen-tree so deep as the mast is long from the Decke to the Pounds. The Leech of a saile is the outward side or skirt of the saile from the earling to the clew, the middle betwixt which we account the Leech. The clew, is the lower corner of a saile, to which you make fast your sheets and Tacks, or that which cometh going out from the square of the saile, for a square saile hath no Clew, but the maine saile must be cut goring, because the Tacks will come closer aboard, and so cause the sail to hold more wind; now when the saile is large and hath a good Clew, we say the spread a large Clew, or spread much Canvas. In making those sailes they use two sorts of seames down the sides, which both save the breadth of the Canvas together, the one we call a Monke seame, which is flat, the other a round seame, which is so called because it is round. The ship being thus provided, there wants yet her Ordnances, which should be in great number according to her building in strength and burthen, but the greatest commonly is the lowest, which we call the lower Tier, if she be furnished fore and aft. Likewise the second Tier, and the third, which are the smallest. The fore Castle and the halfe

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halfe Decke being also furnished, we account halfe a Tier.

Stowage or to stow, is to put the goods in Holole in order. The most ponderous next the Ballast, which is next the Keelson to keepe her stiffe in the Sea. Ballast is either Gravel, Stones, or Lead, but that which is dyest, heaviest, and lies closest is best. To finde a leake, they trench the Ballast, that is, to divide it. The Ballast will sometimes flow, that is, run from one side to another, and so will Corn and Salt, if you make not Pouches or Bulk-heads, which when the Ship both heeld is very dangerous to overset or turn the Heele upward. For Caske that is so stowed, tier above tier with Ballast, and canting Coines, which are little short pieces of wood or Billets cut both a sharp ridge or edge to lie betwixt the Cask: and standing Coines are Billets or pipe-staves, to make them they cannot give way nor stirre. The Ship will bear much, that is, carry much Ordnance or goods, or bear much sail: and when you let any thing down into the Holole, lowering it by degrees, they say, Amaine; and being down, Strike.

Stowage.
To Stow.
Ballast.

Trench the
Ballast,
Shour.

Canting
Coines.

Standing
Coines.

To bear.

F CHAP.

CHAP. VIII.

The charge and duty of the Captain of a ship, and every Office and Officer in a man of War.

The Captains charge.

The Captains charge is to command all, and tell the Master to what port he will go, or to what height; in a fight he is to give direction for the managing thereof, and the Master is to see the running of the ship, and trimming of the sails.

The Master and his Mate's.

The Master and his Mate's are to direct the course, command all the Mariners, for steering, trimming, and sailing the ship; his Mate's are only his seconds, allowed sometimes for the two mid ships men, that ought to take charge of the first prize.

The Pilot.

The Pilot when they make land doth take the charge of the ship till he bring her to harbour.

The Chirurgion and his Mate.

The Chirurgion is to be exempted from all duty, but to attend the sick, and cure the wounded; and good care would be had to have a certificate from Barber-Chirurgions Hall of his sufficiency, and also that his chest be well furnished both for Physicke and Chirurgery, and so near as may be proper for that clime you go for, which neglect hath been the loss of many a mans life.

The Cape-merchant or Purser.

The Cape-merchant or Purser hath the charge of all the Carrigassons or merchandize, and doth keep an account of all that is received, or delivered, but a man of War hath onely a Purser.

The Gunner with his Mate, and quarter Gunners.

The Master Gunner hath the charge of the ordnance, and shot, powder, match, ladles, sprunges, worms, cartridges, arms and fire-works; and the rest of the Gunners, or quarter.

ter Gunners to receiue their charge from him according to directions, and to giue an account of their store.

The Carpenter and his Mate, is to haue the nails, clinches, rope and clinch needles, pikes, splates, rubber iron, pumpe nails, shupper nails and leather, sawes, files, hatchets and such like, and euer ready for ralking, breaming, stopping leakes, fishing, or splicing the masts or yards as occasion requirereth, and to giue account of his store.

The Carpenter and his Mate.

The Boatswaine is to haue the charge of all the roddage, tackling, sailes, flas and marling spikes, needles, twine, saile-cloth, and rigging the ship, his Mate the command of the long boat, for the setting forth of Anchors, weighing or fetching home an Anchor, warping, towing, or moving, and to giue an account of his store.

The Boatswaine and his Mate.

The Trumpeter is alwayes to attend the Captains command, and to sound either at his going a shore, or coming aboard, at the entertainment of strangers, also when you hale a ship, when you charge, board, or enter; and the poepe is his place to stand or sit upon, if there be a noise, they are to attend him, if there be not, euey one he both teach to beat a patt, the Captain is to incourage him, by increasing his shares, or pay, and giue the master Trumpeter a reward.

The Trumpeter.

The Sperrhall is to punish offenders, and to see justice executed according to directions; as ducking at the yards arme, halting under the keele, bound to the Capstern, or main mast with a basket of shot about his necke, setting in the bilboes, and to pay the Cobble or the Bozjone; but the Bopes the Boatswaine is to see euey Sunday at the chest, to lay their compasse, and receiue their punishment for all their wicked offences, which done, they are to haue a quarter can of beer, and a basket of bread, but if the Boatswaine eat or drink befoze he catch them, they are free.

The Marshall

The Corporall is to see the setting and relighting the watch, and see all the souldiers and sailers keep their arms cleane, neat, and yare, and teach them their use.

The Corporal.

The Steward
and his Mate.

The Steward is to deliver out the victuals according to the Captains directions, and messeth them four, five, or six, as there is occasion.

The Quarter-
masters.

The Quarter-masters have the charge of the hold, for stowing, rontaging, and trimming the ship in the hold, and of their squadrons for the watch, and for fishing to have a Sayne, a fidge, a harpin pion, and fish hakes, for Porgos, Bonetos, Dolphins, or Dorados, and rayling lines for Mackrels.

The Cooper
and his Mate.

The Cooper is to look to the Caske, hoppers and twigs, to stave or repair the buckets, barikos, cans, Deep-tubs, runlets, hogheads, pipes, butts, for wine, beer, cider, beverage, fresh water, or any liquor.

The Coxswain
and his Mate.

The Coxswain is to have a choise Gang to attend the skiffe to go to and again as occasion commandeth.

The Cook and
his Mate.

The Cook is to messeth and deliver out the victual, he hath his store of quarter saws, small rens, platters, Spoons, and knives, and is to give his account of the remainder.

The Swabber.

The Swabber is to wash and keep clean the ship and maps.

The Lyar.

The Lyar is to hold his place but for a while, and he that is first taken with a lie, every Sunday is so proclaimed at the maine mast by a generall cry, A Lyar, A Lyar, A Lyar, he is under the Swabber, and onely to keep clean the beake head, and chains.

The Sailers.

The Sailers are the ancient men for hoisting the Taffes, getting the tackes aboard, haling the holdings, and clearing the ship.

The Youngers.

The Youngers are the young men called fore-mast men, to take in the top-salles, or top and yard, for furling the sailles, or furling the yards, hauling or trisling, and take their turns at Helms.

The Lieuten-
ant his place.

The Lieutenant is to associate the Captaine, and in his absence to operate his place, he is to see the Marshall and Corporall to their duties, and assist them in instructing the souldiers, and in a fight the fore-castle is his place to make

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make good, as the Captain both the halfe decke, and the Quarter-masters, or Masters Mate the mid ships, and in a States man of war, he is allowed as necessary as a Lieutenant on shore.

CHAP. IX.

Proper Sea termes for dividing the company at Sea, and steering, sailing, or moving a Ship in fair weather, or in a storm.

It is to be supposed by this the Ship is victualled and manned, the voyage determined, the Steep Tubs in the chains to stie their Waste, Poake, or Fish in salt water, till the salt be out though not the saltnesse, and all things else ready to set sail; but before we go any further, for the better understanding the rest, a few words for steering and running the Ship would not be amisse. When know, Starboard is the right hand, Larboard the left; Starboard the Helm, is to put the Helm a Starboard, then the Ship will go to the Larboard. Right your Helme, that is, to keep it in the mid ships, or right up. Port, that is, to put the Helme to a Larboard, and the Ship will go to the Starboard, for the Ship will ever go contrary to the Helme. Now by a quarter winde, they will say aloofe, or keep your Loofe, keep her to it, have a care of your Le-latch. Touch the winde, and war no more, is no more but to bid him at the Helme to keep her so neer the winde as may be; no neer, ease the Helme, or bear up, is to let her fall to Leeward. Steady, that is, to keep her right upon that point you steer by; be care at the Helme, or a fresh man to the Helme. But he that keeps the Ship most from yawning doth commonly use the least motion with the Helme, and those steer the best.

Steep Tubs.

Starboard.
Larboard.
Cunning.
Steering.
Mid ships.
Port.

Aloofe.
Keep your loof.
War no more.
No neare.
Ease.
Steady.
Yarc.

The

Gearc.

Predy.

A Pike.

Tally.

How they di-
vide the com-
pany at sea,
and set, and
rule the watch.

The Master and company being aboard, he commands them to get the sails to the yards, and about your gearc or work on all hands, stretch forward your maine Halliards, hoist your Sails halfe mast high. Predy, or make ready to set sail, crosse your yards, bring your Cable to the Capsterne; Boatswaine fetch an Anchor aboard, break ground or weigh Anchor. Heare a head, men into the Tops, men upon the yards; come, is the Anchor a pike, that is, to heare the Halwls of the ship right over the Anchor, what is the Anchor away? Yea, yea. Let fall your fore-sail. Tally, that is, hale off the Sheats; who is at the Helme there? coile your Cables in small takes, hale the Cat, a Bitter, belay, lase fast your Anchor with your stank-painter, stow the Boat, let the land, how it bears by the Compasse that we may the better know thereby to keep our account and direct our course, let fall your main sail, every man say his private prayer for a good voyage, out with your sprit sail, on with your bonits and Boablers, steare steady and keep your course, so, you go well.

When this is done, the Captain or Master commands the Boatswaine to call up the company; the Master being chief of the Starboard watch doth call one, and his right hand Mate on the Larboard doth call another, and so forward till they be divided in two parts, then each man is to chuse his Mate, Consort, or Contrab, and then divide them into squadrons according to your number and burthen of your ship as you see occasion; these are to take their turns at the Helme, trim sailes, pumpe, and do all duties each hall, or each squadron for eight Glasses or four hours which is a watch, but care would be had that there be not two Contrabes upon one watch because they may have the more room in their Cabbins to rest. And as the Captain and mates, Boates, Gunners, Carpenters, Quartermasters, Trumpeters, &c. are to be about the Mast, so the Boatswaine, and all the Boaters or common Sailers under his command is to be before the Mast. The next is, to messle them four to a messle, and then give every messle a quarter Can of beere and a bisket of bread to stay their stomacks till the Kettle be

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be holled, that they may first go to prayer, then to supper, and at six a clock sing a Psalm, say a Prayer, and the Master with his crew begins the watch, then all the rest may do what they will till midnight; and then his Mate with his Harbord men with a Psalm and a Prayer relieves them till four in the morning, and so from eight to twelve each other, except some flaw of winde come, some storm or gulf, or some accident that requires the help of all hands which commonly after such good chere in most voyages doth happen.

For now the winde varies, that is, it doth shift from point to point, get your Harbord tacks aboard, and tally or hale off your Lee-sheats. The Ship will not waver, settle your maine Top-salle, barre a sadome of your sheat. The winde comes fair againe and a fresh gale, hale up the flatch of the Lee-bolting. By flatch is meant the middle part of any rope hangs over board. There more sheat, or a storne sheat, that is, when they are not haled home to the blocke. But when we say, let fly the sheats, then they let go againe, which commonly is in some gulf, lest they spend their top-salles, or if her quick side lie in the water, overset the Ship. A storne sheat is when she goes before the winde, or be- tweene a paire of sheats, or all sailes drawing. But the winde shifts, that is, when you must take in the Sheet sail, and get the tacks aboard, hale close the maine Bolting, that is, when your Tacks are close aboard. If you would saile against the winde or keep your own, that is, not to fall to Lee-ward or go back againe, by hauling off close your Bo- lings, you set your sailes so sharp as you can to lie close by a winde, thwarting it a league or two, or more or lesse, as you see cause, first on the one board, then on the other; this we call boarding or beating it up upon a tacke in the winde's eye, or bolting to and againe; but the longer your boards are, the more you work or gather into the winde. If a sudden flaw of winde should surprize you, when you would lower a yard so fast as you can, they call A maine, but a cruise sail cannot come nether the winde than its points, but a Carvell whose sailes stand like a pair of Tailors shooes, will go much neerer.

The winde
varies.
Tally.

Flowne.

Fly.

A paire of
courts.

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How to handle
a ship in a
storm.

Try.

Hull.

Under the
Sea.
Weather
coile.

Rowling.
Labour.
Spoonc.

Trough.

Founder.

To spend a
mast.

Spring a mast.
A Yoke.

If over casts, we shall have winde, cold weather, settle
your top sailes, take in the sprit-saile, in with your top
sailes, lower the fore-saile, fall out under the parrels, brade
up close all them sailes, last sure the ayronance, strike your
top-masts to the cap, make it sure with your shaps feet. A
storme, let us lie at Erie with our main course, that is, to
hale the tacke aboard, the sheet close aft, the booke set up,
and the helme tied close aboard. When that will not serve
then Try the mizen, if that split, or the storm grow so great
the cannot bear it, then hull, which is to bear no sail, but to
stay for some consort, last sure the helme a lee, and so a good
ship will lie at ease under the sea as we terme it. If she
will weather coile, and lay her head the other way without
loosing a sail, that must be done by bearing up the Helm, and
then she will suffer nothing so far to leeward. They call it
hulling also in a calm swelling sea, which is commonly be-
fore a storme, when they strike their sails lest the should beat
them in pieces against the mast by Rowling. We say a ship
doth labour much when she doth rowl much any way; but
if she will neither Try nor Hull, When spone, that is, put
her right before the winde, this way although she will rowle
more than the other, yet if she be weak it will not straine
her any thing so much in the Trough of the sea, which is
the distance betwixt two waves or billowes. If none of
this will do well, then she is in danger to founder, if not
sinke. Foundering is when she will neither bare nor steare,
the sea will so over take her, except you force out the water,
she will lie like a log, and so consequently sinke. To spend
a mast or yard, is when they are broke by cold weather, and
to spring a mast is when it is cracked in any place.
In this extremity be that doth run the ship cannot have
too much judgement, nor experience to try her drift, or hold
the capes, which are two tearms also used in the trials of
the running or setting of currants. A pike is when the sea
is so rough as that men cannot govern the helme with their
hands, and then they cease a block to the helme on each side at
the

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the end, and reëving two fahs thozow them like Canners
Tackles brings them to the ships side, and so some being at
the one side of the Tackle, some at the other, they steere
her with much more ease than they can with a single rope
with a double turn about the Helme.

When the Storme is past, though the winde may alter
thre or four points of the compasse, or more, yet the Sea
for a good time will go the same way; then if your courle
be right against it, you shall meet it right a head, so we call
it ahead Sea. Sometimes when there is but little winde,
there will come a contrary Sea, and presently the winde
after it, whereby we may judge that from whence it came
was much winde, for commonly before any great Storm the
Sea will come that way. Now if the ship may run on shore
in case or mud she may escape, or Billage on a rock, or Anchors
stake, repair her looke, but if she split or sinke, she is a wack.
But seeing the Storm decreaseth, let us trie if she will en-
dure the Hullocke of a Saff, which sometimes is a piece of
the Mizen sail or some other little sail, part opened to keep her
head to the Sea, but if yet she would weather cosse, we will
loose a Hullocke of her fore sail, and put the Helme a wea-
ther, and it will bring her head where her sterne is; courage
my hearts.

A head Sea.

Hullocke.

It cleares up, set your fore sail; Now it is fair weather,
out with all your sails, go large or laske, that is, when
we have a fresh gale, or fair winde, and all sails drawing.
But for more haste unparrell the mizen yard and lanch it,
and the sail over her A & quarter, and sit Gibes at the further
end to keep the yard steady, and with a Boome boome it out;
this we call a Goose-wing. Who is at Helme there? Sirra,
you must be amongst the points; Well Master, the Chan-
nell is broad enough; Yet you cannot steere betwixt a paire
of sheats; Those are words of mockery betwixt the Gunner
and the Steersman. But to proceed.

Large.
Laske

Goosewing.

Get your Harbord Tackles aboard, hale off your Star-
bord sheats, keep your courle upon the point you are di-
rected, Port, he will lay her by the A & ; the stales, or back
stales,

Wales, that is, when all the Tassles flutter in the winde, and are not kept full, that is full of winde, they fall upon the masts and Shrouds, so that the Ship goes a drift upon her broad side, all the Tassles, keep full, full and by. Make ready to Tacke about, is but for every man to stand to handle the sails and ropes they must hale. Tacke about is to bear up the helme, and that brings her to stay all her sailes lying flat against the Shrouds, then as she turns we say she is payed, then let rise your Lee-tacks and hale off your Sheets, and trim all your sailes as they were before, which is cast off that Telling which was the weather bolting, and hale up taught the other. So all your Sheets, Bzaies, and Tacks are trimmed by a winde as before. To belay, is to make fast the ropes in their proper places. Round in, is when the winde lages, let rise the mains tacke and fore tacke, and hale all the fore Sheet to the cats head, and the main Sheet to the rubridge head, this is Rounding in, or rounding all the sail; the Sheets being there they hale them down to keep them firme from flying up with a Bazarado, which is any rope wherewith we hale down the Sheets, blockes of the main or fore sail, when they are haled all the clew of the main sail to the Rubridge head of the main mast, and the clew of the fore sail to the Cat head; Do this when the Ship goes large.

Round in.

Rounding aft.
Bazarado.

Observe the height.

Dead water.

The Wake.

Observe the height; that is, at twelve a clock to take the height of the Sun, or in the night the North Star, or in the forenoon and afternoon, if you make these by finding the Azimuth and Almucantar. Dead water is the Eddy water follows the sterne of the Ship, not passing away so quickly as that slides by her sides. The wake of a Ship is the frothy water a sterne showing the way she hath gone in the sea, by this we judge what way she hath made, for if the wake be right a sterne, we know she makes good her way forwards; but if to Lee-ward a point or two, we then think to the Lee-ward of her course, but she is a nimble Ship that in turning or tacking about will not fall to the Lee-ward of her wake when she hath weathered it. Disin-
togue

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bogue is to passe some narrow strait or current into the maine Ocean, out of some great Gulfe or Bay. A Drift is any thing floating in the sea that is of wood. Rockweed both grow by the shore, and is a stone of land, yet it is oft found far in the sea. Lay the ship by the Lee to trie the Dipsie line, which is a small line some hundred and fifty fadome long, with a long plummet at the end, made hollow, wherein is put talloile, that will bring up any crabell; which is first marked at twenty fadome, and after increased by tens to the end; and those distinguished by so many small knots upon each little string that is fixed at the mark thoro the frowns or middle of the line, shewing it is so many times ten fadome deep, where the plummet both rest from drawing the line out of your hand; this is onely used in deep water when we think we approach the shore, for in the maine sea at 200. fadomes we finde no bottome. When the ship is to right, that is, again under sail as she was, some use a Log line, and some a glass to know what way she makes, but that is so uncertain, it is not worth the labour to triel it.

Disimbogue.
A drift.

Rockweed.

Dipsie line.

Plummer.

Log line.

One to the top to look out for land, the man cries out Land to; which is just so far as a kenning, or a man may discover, desire, or see the land. And to lay a land is to sail from it just so farre as you can see it. A good Land fall is when we fall just with our reckoning, so otherwise a bad Land fall; but how ever how it be, set it by the compass, and bend your cables to the Anchors. A Head land, or a point of land with lie further out at sea than the rest. A Land mark is any Mountaine, Rock, Church, Windmill or the like, that the pilot can know by comparing one by another how they beare by the compass. A Reach is the distance of two points so farre as you can see them in a right line, as White Hall and London Bridge, or White Hall and the end of Lambeth towards Chelsey. Fetch the Sounding line, this is bigger than the Dipsie line, and is marked at two fadome next the lead with a piece of blacke leather, at three fadome the like, but less; at 5 fadome with a

Land to.
Kenning.
To lay a land.

Good land
fall.
Bad land fall.
A head land.
A Point.
Land marke.
To reach
A Reach.

Sounding line.

The Lead.

Fowle water.

Bear in.

Beare off.

Beare up.

Hold off.

Surges.

Neale to.

A Roade.

Offing.

Land locked.

To Ride.

Ride a great

Roade.

piece of white cloth, at 7 fadome with a piece of red in a piece of white leather, at 15 with a white cloth, &c. The sounding lead is six or seven pound weight, and near a foot long, he that doth heave this lead stants by the horse, or in the chaines, and doth sing fadome by the mark 5.0. and a shaftment lesse, 4.100 this is to finde where the ship may sail by the depth of the water. Fowl water is when she comes into shallow water where she raises the sand or oile with her way yet not touch the ground, but she cannot see her helme so well as in deep water.

When a ship sailes with a large winde towards the land, or a fair winde into a harbour, we say she beares in with the land or harbour. And when she would not come nere the land, but goeth more Rime-way than her course, we say she beares off; but a ship boord, beare off is used to every thing you would thrust from you. Bear up is to bring the ship to go large or before the winde. To Hold off is when we heave the Cable at the Capsterne, if it be great and stiff, or stims with oile, it surges or slips back unless they keep it close to the whelps, and then they either hold it fast with nippers, or bring it to the Heare Capsterne, and this is called Holding off. As you approach the shore, shorten your sails, when you are in harbour take in your sails, and come to an anchor, wherein much judgement is required.

We know well the soundings, if it be Nealed to, that is, deep water close aboord the shore, or shallow, or if the sea under the weather shore, or the lee shore be sandy, clay, oile, or fowle and rockie ground, but the sea shore all men would thin that can avoid it. Or a roade which is an open place near the shore. Or the offing which is the open sea from the shore. Or the middest of any great stream is called the offing. Land lock, is when the land is round about you.

Now the ship is said to Ride, so long as the Anchors do hold and comes not home. To Ride a great roade is when the winde hath much power. They will strike their top masts, and the yards alongst ships, and the deeper the water is, it requires more Cable; when we have rid in any off-
streke

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Stresse we say we have the hawse full, because the water broke into the hawse. **To ride betwixt winde and tide**, is when the winde and tide are contrary and of equall power, which will make her roole extremely, yet not strain much the cable. **To ride thwart** is to ride with her side to the tide, and then she never strains it. **To ride apike** is to pike your yards when you ride amongst many ships. **To ride across** is to hold the main and fore yards to the bounds, and topped alike. When the water is gone and the ship lies dry, we say she is **beled**; if her head but lie dry, she is **beled a head**; but if she cannot all lie dry, she cannot **bele** there. **Water born** is when there is no more water than will just bear her from the ground. **The water line** is to that Bend or place she should swim in when she is loaded.

To moore a ship is to lay out her anchors as is most fit for her to ride by, and the wayes are divers; as first, to moore a fair Weather from any annoyance. **To moore a crosse** is to lay one anchor to one side of the stream, and the other to the other right against one another, and so they beare equally ebbe and flood. **To moore along** is to lay an anchor amonst the stream ahead, and another asterne, when you fear bying a shoar. **Water shot** is to moore quartering be- thwart both neither crosse, nor along the tide. In an open rode they will moore that way they think the wind will come the most to hurt them. **To moore a pibisso**, is to have one anchor in the river, and a hawser a shoar, which is moored with her head a shoar; otherwile the cable is the least, and four cables the best to moore by.

Ride a stress.
Ride betwixt winds and tide.

Ride thwart tide.
Ride a pike.
Ride crosse.

Sewed.
Sew.
Water born.
Water line.

To moore.

More crosse.

More along.

Water shot.
along dead A

More Provisa.

CHAP.

There are two parts to public law, because the body
of the law is the statute, and the other is the

CAAP-X

Propensities for the Winds, Ebbes, Floods, and

Eddies, with their definitions, and an estimate of the depth of the Sea, by the height of the Hills and the largeness of the Earth.

...the largeness of the Earth.

W here there is not a breath of wind stirring, it is
a calm or a sturke calme. A Breeze is a wind
blown out of the Sea, and commonly in faire

and lasteth till morn night; so likewise all the night it is
from the same which is called a Tornado or a storm.

this is but upon such coasts where it bloweth, thus most certainly, except it be a Storm, or very foul weather, as in

Barbaria, Egypt, and the most of the Levant. The habs
such as Syria in most hot countries in Summer, but they
are here uncertain. I catch 45 lbs in the North, South, West

A faire Faire Vale is the best to saile in, because the Sea

is so much wine as our top sails can endure to bear. An
 Coole wine is checked by the fast

or any such thing that makes it return back again. It over
blowes when we can bear no top sailes. A flaw of winde is
a gust which

A Gull which is very violent upon a sudden, but quickly
endeth. A Spout in the West Indies commonly falleth in
these Gulls, which is, as it were, a small river falling out

high. ~~and~~ ~~as~~ ~~it~~ ~~was~~, a small River falling di-
rectly from the clouds, like out of our water Spouts, which
make the Sea where it falleth rebound in flashes, exceeding

waues at once. A storm is known to every one not to be much

A Calme.

A Breeze

A fresh gale.

A Loom
gale.

Eddie winde.
It overblows.

A Gift.
A Spout.

A whirlwind.
A Storm.

When there is not a breath of winde stirring, it is a calm or a sharke calme. A Breeze is a winde blowes out of the Sea, and commonly in faire weather beginneth about nine in the morning, and lasteth till neere night; so likewise all the night it is from the shore which is called a Turnado, or a Sea-turn, but this is but upon such coasts where it bloweth thus most certainly, except it be a Storm, or very foul weather, as in Barbary, Egypt, and the most of the Levant. We have such Breezes in most hot countreys in Summer, but they are very uncertaine. A fresh Gale is that both presently bloweth after a calm, when the winde beginneth to quicken or blow. A faire Land Gale is the best to saile in, because the Sea goeth not high, and we beat out all our sailes. A stiff Gale is so much winde as our top sailes can endure to bear. An Eadie winde is checked by the sail, a mountains turning, or any such thing that makes it return back again. It overblowes when we can bear no top sailes. A flaw of winde is a Gust which is very violent upon a sudden, but quickly endeth. A Spout in the West Indies commonly falleth in those Gusts, which is, as it were, a small river falling continually from the clouds, like out of our water Spouts, which make the Sea where it falleth rebound in flashes, exceeding high. Whirle winde runneth round, and bloweth divers wayes at once. A Storm is known to every one not to be much

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much leffe than a tempest, that will blow down houses, and
trees up by the roots. A Sponsionne is a constant winde in the
East Indies, that bloweth alwayes three moneths together
one way, and the next three moneths the contrary way. A
Bericano is so violent in the West Indies, it will continue
three, four, or five weekes, but they have it not past once in
five, six, or seven years; but then it is with such extremity
that the Sea flies like rain, and the waves so high, they
over flow the low grounds by the Sea, in so much, that ships
have been driven over tops of high trees there growing, ma-
ny leagues into the land, and there left, as was Captain
Francis Nelson an Englishman, and an excellent Sea-man
for one.

We say a calme sea, or Becalmed, when it is so smooth the
Ship moves very little, and the men leap over board to swim.
A Rough Sea is when the waves grow high. An over-
grown Sea when the surges and billowes go highest. The
Rut of the sea where it both dash against any thing. And the
Roaring of the Sea is most commonly observed a shore, a
little before a storm or after a storm.

Flood is when the water beginneth to rise, which is young
flood as we call it, then quarter flood, halfe flood, full Sea,
kill water, or high water. So when it Ebbes, quarter ebbe,
halfe ebbe, three quarter ebbe, low water, or dead low water
every one doth know; and also that as at a spring tide the
Sea or water is at the highest, so at a Neape tide it is at the
lowest. This word Tide, is common both to Flood and
Ebbe; for you say as well tide of ebbe, as tide of flood, or a
windward Tide when the Tide runnes against the stream,
as a Lee-ward Tide, that is, when the winde and the Tide
goeth both one way, which makes the water as smooth as
the other rough. To Tide over to a place, is to go over
with the Tide of ebbe or flood, and stop the contrary by
anchoring till the next Tide, thus you may work against the
winde if it over blow not. A Tide gate is where the Tide
runneth strongest. It flowes Tide and halfe Tide, that is,
it will be halfe flood by the shore, before it begin to flow in
the

A Tempest.
A Mounfounce.

A Hericano.

Becalmed.

A Rough Sea.
An overgrown
Sea.
Surges.
The Rut of the
Sea.
The roaring
of the Sea.
Floods and
ebbes.

A Tide of
ebbe.
A Tide of
flood.
A windward
Tide.
A Lee-ward
Tide.
To Tide over.
A Tide gate.
Tide and halfe
Tide.

Eddie Tide.

the channell; so, although the Tide of flood run aloft, yet the Tide of ebbe runnes close by the ground. An Eddie tide is where the water both run back contrary to the tide, that is, when some headland or great point in a River hindereth the free passage of the stream, that causeth the water on the other side the point to turn round by the shore as in a circle, till it fall into the tide again.

As touching the reasons of ebbes and floods, and to know how far it is to the bottome of the deepest place of the Sea, I will not take upon me to discourse of; as knowing the same to be the secrets of God unrevealed to man: only I will set down a Philosophicall speculation of others mens opinions touching the depth of the Sea; which I hope will not be thought much impertinent to the subject of this book by the judicious Reader.

The height of mountains perpendicular.

Fabianns in Plinie, and Cleomides conceived the depth of the Sea to be sixtens furlongs, that is, a mile and 2 parts, Plutarch compared it equall to the highest mountaines, Scaliger and others conceited the hills farre surpassed the deepest of the Sea, and that in few places it is more then a hundred paces in depth, it may be he meant in some narrow Seas, but in the main Ocean experience hath taught us it is much more than twice so much, so, I have sounded 300 fadome, yet found no ground. Eratosthenes in Theon that great Mathematician writeth the highest mountain perpendicular is but ten furlongs, that is, one mile and a quarter. Also Dicæarcus affirmeth this to be the height of the hill Pelius in Thessalia, but Xenagoras in Plutarch observed the height of Olympus in the same region to be twenty paces more, which is 1270. paces, but surely all those meane onely those mountaines in or about Greece, where they lived and were best acquainted; but how these may compare with the Alpes, in Asia, Atlas in Africa, Caucasus in India, the Andes in Peru, and others, others hath not yet been examined.

The height of the hills compared with the superficies of the earth and depth of the Sea.

But whatsoever the hills may be above the superficies of the earth, many hold opinion the Sea is much deeper, who
sup-

Suppose that the earth at the first framing was in the superficies regular and sphericall, as the holy Scripture directs us to believe; because the water covered and compassed all the face of the earth, also that the face of the earth was equall to that of the Sea. Damascen noteth, that the unevenness and irregularity which now is seen in the earths superficies, was caused by taking some parts out of the upper face of the earth in sundry places to make it more hollow, and lay them in other places to make it more convex, or by raising up some part and depressing others to make roome and recess for the Sea, that mutation being wrought by the power of the word of the Lord, Let the waters be gathered into one place, that the dry land may appear. As for Aquinas, Dionysius, Catharinus, and some Divines that conceived there was no mutation, but a violent accumulation of the waters, or heaping them up on high is unreasonable; because it is against nature, that water being a flexible and a ponderous body, so to consist and stay it selfe, and not fall to the lower parts about it; where in nature there is nothing to hinder it, or, if it be restrained supernaturally by the hand and byole of Almighty God, lest it should overthrowe and burie all the land, it must follow, that God even in the very institution of nature imposed a perpetuall violence upon nature. And this withal, that at the Deluge there was no necessity to breake up the springs of the deep, and to open the cataracts of Heaven, and poure down water continually so many dayes and nights together, seeing the only with-drawing of that flood, or letting go of that badge which restraineth the water would presently have overwhelmed all.

But both by Scriptures, the experience of Navigators, and reason in making estimation of the depth of the Sea, reckon not onely the height of the hills above the common superficies of the earth, but the height of all the dry land above the superficies of the Sea, because the whole masse of earth that now appeareth above the waters, being taken as it were out of the places whith the waters now possesse,

It

must

How all the hills and dry land above the superficies of the Sea hath made room for the Sea, therefore they are in equall height and depth.

must be equall to the place out of which it was taken: so consequently it seemeth, that the height or elevation of the one should answer the descension or depth of the other; and therefore in estimating the depth of the Sea, we consider not onely the elevation of the hills above the ordinary land, but the advantage of the dry land above the Sea; which latter, I mean the height of the ordinary maine land, excluding the hills, which properly answer the extraordinary depths and white poles in the Sea. The rest is held more in large Continents above the Sea, than that of the hills is above the land.

That there is
small differ-
ence betwixt
the Springs
first rising out
of the earth,
and their fall-
ing into the
Sea.

So that the plain face of the dry land is not level, or equal-
ly distant from the Center, but hath a great descent towards
the Sea, and a rising towards the inland parts, although
it appear not plainly to the eye, yet to reason it is most mani-
fest; because we finde that part of the earth the Sea covereth
descendeth lower and lower towards the Sea. For the Sea,
which touching the upper face of it, is known by nature to be
level and evenly distant from the center, is observed to grow
deeper and deeper the further one sailleth from the shores to-
wards the main Ocean: even so in that part which is unco-
vered, the streamings of rivers on all sides from the inland
parts towards the Sea, sliding from the higher to the lower de-
cl. seth so much, whose courses are some 1000 or 2000 miles,
in which declination, Pliny in his derivation of water re-
quireth one cubit of declining in 240 foot of proceeding. But
Columella, Vitruvius, Paladius, and others, in their condui-
on of waters require somewhat lesse; namely, that in the
proceeding of 200 foot forward, there should be allowed one
foot of descending downward, which yet in the course of 1000
miles, as Danubius, Volgha, or Indus, &c. have so much or
more, which will make five miles of descent in perpendi-
cular account, and in the course of 2000 or more, as Nilus,
Niger, and the River of the Amazons have 10 miles or more
of the like descent.

The determi-
nation of these
questions.

These are not taken as rules of necessity, as though water
could not runne without that advantage, for that respect
the

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the conveyers of waters in these times content themselves with one inch in 600 foot, as Philander and Vitruvius observed, but is rather under a rule of commodity for expedition and wholesomenesse of water so conveyed, lest resting too long in pipes it should contract some unwholesome condition, or else through the slackness of motion, or long closenesse, or banishment from the aire, gather some aptnesse and disposition to putrefie. Although I say, such excess of advantage as in the artificiall conveyance of waters the forerunners Authors require, be not of necessity exacted in the naturall derivation of them, yet certain it is, that the descent of rivers being continually and their course long, and in many places swift, and in some places headlong and furious, the differences of height or advantage cannot be great betwixt the springs of the rivers and their out lets, betwixt the first rising out of the earth and their falling into the Sea: unto which diversity of land falling the deepnesse of the Sea in proportion answer as I before declared, and not onely to the height of the hills: it is concluded, that the deepnesse to be much more than the philosophers commonly reported: and although the deepnesse of the Carolinian Sea, which Aristotle saith, was the depth of the Mediterranean, reported by Pomponius in Strabo, to have been found but 1000 fathoms, which is but a mile and a fifth part, and the greatest breadth not past 200 miles: then seeing it to be narrow a Sea it be so deep, what may we expect in the main Ocean to be, that in many places is five times so broad, seeing the breadth the Seas are, if they be intire and free from Islands, they are undoubtedly observed to be the deeper. If you desire any further satisfaction, read the first part of Purchas his Pilgrimage, where you may read how to finde all these Authors at large. Now because he hath taken near 100 times as much from me, I have made bold to borrow this from him, seeing he hath sounded such deep waters so, this our ship to sail in, being a Gentleman whose person I loved, and whose memory and letters I will ever honour.

Note, the difference betwixt the springs of the rivers, and their falling into the Sea is not great.

CHAP. XI.

Proper Sea-terms belonging to the good or bad condition of Ships, how to finde them and amend them.

A wholesome
ship.

An unwhol-
some Ship.
Howling a
Ship.

Flaring.

A Ship that will try hull, and ride well at Anchor, we call a wholesome Ship. A long Ship that drawes much water will doe all this, but if she draw much water and be short, she may hull well, but neither try nor ride well; if she draw little water and be long, she may try and ride well, but never hull well, which is called an unwholsome Ship. The howling in of a Ship is when she is past the breadth of her bearing she is brought in narrow to her upper works: it is certain this makes her wholesome in the Sea without rowling, because the weight of her Ordnance doth counterpoise her breadth under water, but it is not so good in a man of warre, because it taketh away a great deal of her room, nor will her tacks ever so well come aboard as if she were laid out aloft and not flaring, which is when she is a little howling in, near the water, and then the upper work doth hang over again, and is laid out broader aloft, this makes a Ship more roomy aloft for men to use their arms in, but Sir Walter Rawleighs proportion, which is to be proportionally brought to her other work is the best, because the counterpoise on each side doth make her swiftness perpendicular or straight, and consequently steady, which is the best.

If a Ship be narrow, and her bearing either not laid out enough or too low, then you must make her broader and her bearing the higher by ripping off the planks two or three

thick Strakes under water and as much above, and put other Timbers upon the first, and then put on the planks upon those Timbers, this will make her beare a better sail, but it is a hinderance to her sailing, this is to be done when a Ship is cranke sided and will beare no saile, and is called Furring. Note also, that when a Ship hath a deep Keele it doth keep her from rowling. If she be floaty and her Keele shallow, put on another keele under the first to make it deeper, for it will make her hold more in the water, this we call a false Keele. Likewise if her Stem be too flat to make her cut water the better, and not gripe, which is when she will not keep a swinge well, fit another Stem before it, and that is called a false Stem, which will make her rid more way and beare a better saile. Also the Run of a Ship is as much to be regarded, for if it be too short and too full below, the water comes but slowly to the Rudder because the force of it is broken by her breadth, and then to put a false stem post to lengthen her is the next remedy, but to lengthen her is better, for when a Ship comes off handsomely by degrees, and her Luck doth not lie too low, which will hinder the water from coming swiftly to the Ruder, makes her she cannot stear well, and they are called as they are, a good runne or a bad. When a Ship hath lost a piece of her Keele, and that we cannot come well to mend it, you must patch a new piece unto it, and binde it with a stirrup, which is an iron comes round about it, and the Keele up to the other side of the Ship, whereto it is strongly nailed with Spikes. Her rake also may be a defect, which is so much of the Hull as by a perpendicular line the end of the Keele is from the setting on of the Stem, so much as is without that forward on, and in like manner the setting in of her Stem Post. Your French men gives great Rakes forwards on, which makes her give good way and keep a good winde, but if she have not a full bowe she will pitch her head extremely in the sea. If she have but a small Rake, she is so bluffe that the Seas meet her so suddenly upon the Bowes she cannot cut the water much, but the longer a Ship is, the fuller should be her

Cranke side.

Furring.

A false Keele.

Gripe.

A false Stem.

The runne.

A good runne.

A bad runne.

A Stirrup.

Her Rake.

Looms.

Heel'd. gain'd

Oversee.
Overthrow.

Walk.
Wall reared.

Iron sickle.

Trim. Long A

Her form, but the down to the bottom. The forming of a ship is her proportion; that is, as she does then great or little. Her water or depth is to many feet as she goes in the water, but the ships that draw most water are commonly the most wholesome, but the least of draught goes best but some more, and the less a ship's draught is, the less she will be able to carry, but the less she will be able to carry, the less she will be able to carry.

The greater of overboard a ship, is by bearing too much sail, and being her heels up, and by on those overthrow her by grounding her, for that she falls upon one side; and we say a ship is down when she is list a side, and hath not ballast enough to her to keep her straight. A ship will be down when she is righted up, after she comes to her bearing it makes her all upon one side, but it gives her with her much room, and she is very wholesome, if her bearing be well kept out. The speaking of a ship is much to be considered, and with much care her to sail well or ill, as I have related in the making of a ship. From then, as when the bolts, spoken, by splices are so taken with that they stand hollow in the plank, and so makes her loose, the which is prevent, they use to put lead butt and the bolts under water, and by the making of a ship does much amend of her hull, and so alters her condition. To make her firm, that is, how she will sail best, is by trying her sailing with another ship, so many glasses witness a head, and so many a stern, and so many upon an even keel; also the sailing of her up and down, for some ships will sail much better when they are down than when they are upright.

CHAP.

CAAP. XII.

Considerations for a Sea Captaine in the choise of his ship, and in placing his Ordnance. In giving Chase, Boording, and entering a man of warre like himselfe, or a defending Merchant man.

If I and for this we call a man of war a Soldier either on foot or horse, and at sea a ship, which if she be not well built, conditioned, and provided, as were fitting such an employment as may be, she may prove either, as a horseman that knoweth not how to hold his reins, keep his seat in his saddle and stirrups, carry his body, nor how to help his horse with leg and spur in a curbet, gallop, or stop; as an excellent horseman that knoweth all, this mounted upon a jade that will do nothing, which were he mounted according to his experience, he would be more with that one, than with a dozen of the other though as well provided as himselfe. And I remember, every horseman cannot mount himself alike, neither every Seaman ship himselfe as he should, I mean not for outward ornament, which the better they are, the less to be desired; for there cannot be a braver sight than a ship in her battery, but of a competent sufficiency as the business requireth. But were I to chuse a ship for my self, I would have her fast well, yet strongly built, her decks flush and flat, and so strong that men might passe with ease; her Bowe and chase so Gally-like contrived, so to bear as many Ordnances as with convenience she could; for that alwayes cometh most to fight, and so stiff, she should bear a Riffe sail and bear out her lower tier in any reasonable weather, neither should her Gun-tome be unprovided: not manned like a Merchant-man, which if they

How to chuse a Ship fitt to make a man of warre.

they be double manned, that is, to have twice so many men as would saile her, they think it is too many in regard of the charge, yet to speak true, there are few Merchant Ships in the world do any way exceed ours. And those men they entertaine in good voyages have such good pay, and such acquaintance one with another in shipping themselves, that thirty or forty of them would trouble a man of warre with thirty or four times their number manned with prest men, being halfe of them scarce hale Boulters, Men, and many times a Pirat who are commonly the best manned, but they fight only for wealth, not for honour nor revenge, except they be extremely constrained. But such a Ship as I have spoken of well manned with rather too many than too few, with all sufficient Officers, Shot, powder, Miskall, and all their portinances, in my opinion might well passe muster for a time of war.

His reward
that first de-
scries a Ship, or
enters a prize.

How to give
chase, and
escape the
chaser.

And thus being at sea, the tops are selome without one or other to look out for pirates, because he that first descries a sail, if the prize pay is to have a good suite of Apparell, or so much money as is set down by order for his reward, as also he that doth first enter a Ship therein a certain reward allotted him, when the Ship alter her course, and useth all the means she can to catch you up, you are the chase, and he the chaser. In giving chase or chasing, or to escape being chased, there is required an infinite judgement and experience, for there is no rule for it; but the shortest way to catch up your chase is the best. If you be to leeward, get all your Macks aboye, and shape your course as he doth to meet him at the nearest angle you can, then he must either alter his course and Macks as you Macks as near the wind as he can lie to keep his own till night, and then strike a Hull that you may not desery him by his sails, or do his best to lose you in the darke; for look how much he falls to leeward, he falls so much in your way. If he be right ahead of you, that is called a sterne chase, if you weather him, for every man in chasing doth seek to get the weather, because you cannot board him except you weather him, he will laske,

or go large, if you gather on him that way, he will trie you before the winde, then if your ordnance cannot reach him, if he can out-strip you he is gone: But suppose you are to winde-ward, if he clap close by a winde, and there goes a head sea, and yours a lee-ward ship, if you do the like your ship will so beat against the sea, the will make no way; therefore you must go a little more large though you chase under his lee till you can run ahead.

Boord and Board is when two ships lie together side by side, but he that knoweth how to defend himself, and work well, will so run his ship, as force you to enter upon his quarter, which is the highest part of the ship, and but the main shrouds to enter by; from whence he may do you much hurt with little danger, except you fire him, which a Pirat will never do, neither sink you if he can chuse, except you be able to force him to defend himself. But in a Sea fight we call **Boarding**, in Boarding where we can, the greatest advantage for your Ordnance is to boord him thwart the halfe, because you may use all the ordnance you have on one side, and the onely them is her prow; but the best and safest boarding for entering is on the bowe, but you must be carefull to cleare the decks with burning grenades, fire-pots, pouches of powder, to which give fire by a Gun-powder match, to prevent traines to the powder chest, which are long boates joyned like a triangle with others broad ledges on either side, wherein lieth as many peble stones or beach as can there lye, those being fired will make all clear before them. Besides in an extremity a man would rather blow up the quarter deck, half deck, fore castle, or any thing, than be taken by him he knowes a mortall enemy, and commonly there are more men lost in entering, if the chase stand to her defence, in an instant, than in a long fight boord and boord, if she be provided of her close fights: I confesse, the charging upon trenches, and the entrances of a breach in a rampire are as empty as desperate as a man would think could be performed, but he that hath tried himself as oft in the entering a resting ship as I have done both them and the

Boord and
boord.

Boarding and
entering a
ship.
Powder chests.

other, he would sure y^e confesse there is no such dangerous service ashore, as a resolved resolute fight at sea. A ships close fights, &c small ledges of wood laid crosse one another like the grates of iron in a prisons windows, betwixt the main mast, and the fore mast, and are called gratings, or nettings as is said, which are made of small ropes, much in the manner covered with a sail; the which to undo is to heave a kedger, or fix a grappling into them, tied in a rope, but a chaine of iron is better, and shearing off will tear it in pieces if the rope and anchor hold, some have used shear hooks which are hooks like sickels fixed in the ends of the yards arms, that if a ship under sail come to board her, those shears will cut her shrouds, and spoil her tackling, but they are so subject to break their own yards, and ere all the ropes comes from the top sails, they are out of request. To conclude, if a ship be open presently to board her is the best way to take her. But if you see your chase strip himselfe into fighting sailes, that is to put out his colours in the pique, his flag in the main top, his streamers or pendants at the ends of his yards armes, furle his spact-sail, pike his mizen, and sing his maine yard, provide your self to fight. Now because I would not be tedious in describing a fight at sea, I have troubled you with this short preambles that you may the plainer understand it.

Evidences
that a chase
will fight.

CHAR.

CHAP. III.

How to Manage a fight at Sea, with the proper terms
In a fight largely expressed, and the ordering of a
Navy at Sea.

For this master piece of this worke, I confesse I
might do better to leave it to every particular mans
conceit as it is, or those of longer practice or more
experience, yet because I have seen many booke of
the Art of Warre by land, and never any for the Sea, sit-
ting all men so silent in this most difficult service, and
there are so many young Captains, and others that desire
to be Captains, who know very little, or nothing at all to
any purpose, for their better understanding I have proceeded
thus far; now for this that follows, what I have seen,
done, and conceived by my small experience, I refer me to
their friendly constructions, and well advised considerati-
ons.

Many booke of
the Art of
War for the
land, none for
the sea.

A sail, when hears the or stands she, to wind-ward or
lee-ward? let him by the Compasse; he stands right ahead,
or on the weather-Bow, or la-Bow, let sit your colours if
you have a consort, else not. Out with all your sails, a steady
man to the helme, sit close to keep her steady, give him chase
or fetch him up; he holds his own, no, we gather on him.
Captain, out goes his flag and pennants, also his waste
clothes and top-armings, which is a long red cloth about
three quarters of a yard broad, edged on each side with
Calico or white linnen cloth, that goeth round about the
ship on the out lines of all her upper works fore and aft, and
before the rudder-head, also about the fore and maine
tops, as well for the countenance and grace of the ship, as
to cover the men for being seen, he furles and flings his
maine

To give chase.

Waste clothes,
Top-armings.

Fighting sails.
To hale a ship.

How to begin
a fight.

maine yard, in goes his spret-salle. Thus they use to strip themselves into their short sails, or fighting sails, which is onely the fore sail, the maine and fore top sailes, because the rest should not be fired nor spoiled; besides they would be troublesome to handle, hinder our sights and the using our armes; he makes ready his close fights fore and aft.

After, how stands the chase? Right on head I say; Well we shall reach him by and by; What's all ready? Hea, hea, every man to his charge, holse your top-salle to salute him for the Sea, hale him with a noise of trumpets; Whence is your ship? Of Spaine; Whence is yours? Of England, Are you a Merchant, or a man of War? We are of the Sea, He waves us to Leeward with his bratter sword, calls amain for the King of Spaine, and springs his louse, give him a chase piece with your broad side, and run a good berth ahead of him; Done, done. We have the winde of him, and he tackes about, tacke you about also and keep your louse, be yare at the helme, edge in with him, give him a volley of small shot, also your prow and broad side as before, and keep your louse; He payes us shot for shot; Well, we shall requite him; What are you ready again? Hea, hea. Try him once more, as before; Done, done; Keep your louse and load your ordnance again; Is all ready? Hea, hea; edge in with him again, begin with your bowe pieces, proceed with your broad side, and let her fall off with the winde, to give her also your full chase, your weather broad side, and bring her round that the sterne may also discharge, and your tackes close aboard again; Done, done, the winde beates, the Sea goes too high to board her, and we are shot thozow and thozow, and between winde and water. Try the pump, beat up the helme; After, let us breathe and refresh a little, and sling a man over board to stop the leakes; that is, to trusse him up about the middle in a piece of canvas, and a rope to keep him from sinking, and his armes at liberty, with a malet in the one hand, and a plug lapped in Okum, and well farred in a tarpawling clout in the other, which he will quickly beat into the hole or holes the bullets make; What chere mates?

to all well? All well, all well, all well; Then make ready to beat up with him again, and withall your greet and small shot charge him, and in the smoke board him thwart the halfe, on the boore, mid Ships, or rather then fassle, on his quarter, or make fast your graplings if you can to his close fights and wear off. Captain, we are sowel on each other, and the Ship is on fire, cut any thing to get clear, and smother the fire with wet clothes. In such a case they will presently be such friends, as to help one the other all they can to get clear, lest they both should burn together and sink; and if they be generous, the fire quenched, drink kindly one to another; heave their cans over board, and then begin again as before.

Well Master, the day is spent, the night drawes on, let us consult. Chirurgion, look to the wounded, and winde up the pain, with each a weight or bullet at their heads and feet to make them sinke, and give them three Gunnes for their funerals. Swabber, make clean the Ship; Purser recozd their Names; Watch, be vigilant to keep your berth to winde ward that we lose him not in the night; Gunners, sponge your Ordnance; Soldiers, scower your pices; Carpenters, about your leakes; Boatswaine and the rest, repair the sails and shrouds; and Cooke, you observe your directions against the morning watch; Boy, Holla Master, Holla, is the Kettle boiled? yea, yea; Boatswaine, call up the men to prayer and break fast.

Boy, fetch my cellar of bottels, a health to you all foze and aft, courage my hearts for a fresh charge; Gunners, beat open the ports, and out with your lower fire, and bring me from the weather side to the lee, so many pices as we have ports to bear upon him. Master, lay him aboard louse for louse; mid Ships men, see the tops and yards well manned, with stones, fire pots, and brasse bailes, to throw amongst them before we enter, or if we be put off, charge them with all your great and small shot, in the smoke let us enter them in the shrouds, and every Squadron at his best advantage; so sound Drums and Trumpets, and Saint George for England.

They

A consultation and direction in a sea fight, and how they bury their dead.

A preparation for a fresh charge.

How a prize
doth yeeld,
and how to
entertain him
Sea-man like.

They hang out a flag of truce, hale him a main, abase, or take in his flag, strike their sails and come aboard with their Captaine, Purser and Gunner, with their commission, rocket, or bills of loading. Out goes the boat, they are lanchd from the ship side, entertaine them with a generall cry, God save the Captain and all the company with the Trumpets sounding, examine them in porticular, and then conclude your conditions, with feasting, freedome, or punishment, as you finde occasion; but alwayes have as much care to their wounded as your own, and if there be either young women or aged men, use them nobly, which is ever the nature of a generous disposition. To conclude, if you surprize him, or enter perforce, you may stow the men, rife, pillage, or sack, and cry a pisse.

How to call a
Councell of
War, and or-
der a Navy
at Sea.

To call a Councell of Warre in a Fleet: There is your Councell of Warre to manage all businesses of import, and the common Councell for matters of small moment, when they would have a meeting, where the Admirall doth appoint it; if in the Admirall, they hang but a flag in the maine shrouds; if in the Vice Admirall, in the fore shrouds; if in the Reare Admirall, in the mizen; If there be many squadrons, the Admirall of each squadron upon sundry occasions doth carry in their main tops, flags of sundry colours, or else they are distinguished by severall pendants from the yard armes; every night or morning they are to come under the A & of the Admirall to salute him and know his pleasure, but no Admirall of any squadron is to bear his flag in the maine top, in the presence of the Admirall generall, except the Admirall come aboard of him to Councell, to dinner, or collation, and so any ship else where he so resideth during that time, is to wear his flag in the main top. They use to marshall or order those squadrons in ranks like Manaples, which is four square, if the winde and Sea permits, a good berth or distance from each other, that they becalm not one another, nor come not so close of each other: the Generall commonly in the midst, his Vice Admirall in the front, and his Reare Admirall in the Reare; or otherwise like a halfe.

halfe Poone, which is two Squadrons like two triangles for the two hornes, and so the rest of the Squadrons behinde each other a good distance, and the Generall in the midst of the halfe circle, from whence he seeth all his Fleet, and sendeth his directions, as he findes occasion to whom he pleaseeth.

Now between two Parties they use often, especially in a harbour or road where they are at Anchor, to fill old Barks with pitch, tar, traine oil, lin-seed oil, brimstone, rosin, reeds, with dry wood, and such combustible things, sometimes they linke three or four together in the night, and put them adrift as they finde occasion. To passe a foote some will make both ships and sails all black, but if the foote keep but a fire on the other side, and all the pieces point blanke with the fire, if they discharge what is betwixt them and the fire, the shot will hit if the rule be truly observed; for when a ship is betwixt the fire and you, the shot keep you from taking it till she be past it. To conclude, there is as many Stratagems, advantages, and inventions to be used as you finde occasions, and therefore experience must be the best Tutor.

Stratagems for Sea-men.

CHAP.

CHAP. XIV.

The names of all sorts of great Ordnance, and their appurtenances, with their proper terms and expositions, also divers observations concerning their shooting, with a Table of proportion for their weight of metall, weight of powder, weight of shot, and there best at randome and point blank enlarged.

The Names of
great Ord-
nance.

Carriages.

Trunnions.

Capsquares.

Wheeles.

Trucks.

To mount a
Peece.

To dismount a
Peece.
Beds.

A Canon royall, or double Canon, a Canon, a Canon Serpentine, a bastard Canon, a demy Canon, a Canon jastro, a culvering, a Basilisk, a demy Culvering, a bastard Culvering, a Saker, a minion, a Falcon, a Falconet, a Serpentine, a Rabbinet. To all these do belong carriages whereon pieces do lie supported by an axeltree betwixt two wheeles, whereon doth lie the piece upon her trunnions, which are two knobs cast with the piece on each of her sides, which doth lie in two halfe holes upon the two cheekes of the carriages, to raise her up or down as you will, over them are the capsquares, which are two broad pieces of iron doth cover them, made fast by a pin with a fore locke to keep the piece from falling out. That the piece and carriages is drawn along upon wheeles every one doth know, if she be for land service, they have wheeles made with spokes like coach wheeles, and according to their proportions strongly made with iron, and the pins at the ends of the Axeltree are called Linch pins.

If for Sea she have Trucks, which are round intire pieces of wood like wheeles. To mount a piece is to lay her upon her carriages; to dismount her, to take her down. Her Bed is a plank doth lie next the piece, or the piece upon it upon the carriage, and betwixt the piece and it they put their quoincs,

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quoines, which are great wedges of wood with a little handle at the end to put them forward or backward for levelling the piece as you please. To trabas a piece is to turn her which way you will upon her platform. To dispart a piece is to finde a difference betwixt the thicknesse of the metall at her mouth and breech or carnouse, which is the greatest circle about her breech, and her muzzle Ring is the greatest circle about her mouth thereby to make a just shot, there are others wayes to dispart her, but the most easiest is as good as the best: and that is but by putting a little sticke or a straw that is strait into the touch hole to the lower part of the Cylinder or Concave, which is the bore of the piece and cut it off close by the metall, and then apply it in the same manner to the mouth, and it will exactly shew you the difference, which being set upon the muzzle of the piece with a little Clay, pitch, or Wax, it will be as the pur of any piece is to the light, leuell to the carnouse or breech of the piece, otherwayes you may give her allowance according to your judgement.

Taper boared, is when a piece is wider at the mouth then towards the breech, which is dangerous (if the Bullet go not home) to burst her. Wontombed, is when she is ill cast or overmuch worne she will be ragged within, which is dangerous for a crosse barre shot to catch hold by, or any ragge of her wadding being a fire and sticking there may fire the next charge you put in her; and you may finde if she be Taper boared, either with a crow'd wyer at the end of a long stasse, by scratching up and down to see where you can catch any hold, or a light candle at the end of a stasse thrust up and down to see if you can see any fault. Bitchings are the ropes by which you lash your Ordnance fast to the Ships side in foule weather. Chambers is a charge made of brasse or iron which we use to put in at the breech of a sling or murtherer containing just so much powder as will bite away the case of stones or shot, or any thing in her. In a great piece we call that her Chamber so far as the powder doth reach when she is loaded.

Quoines.

Travas.

Dispart.

Breech.

Carnouse.

Muzzle.

Cylinder.

Concave.

Bore.

How to dispart
a piece.

Taper boared.

Hony-comb.

How to finde
it.

Bitchings.

Chambers.

Carriages.

Cases.

A Budge-
barrell.

A Ladle.

A Sponge.

A Rammer.

Waddings.

Wood cases.

Case shot.

Round shot.

Crosse bar
shot.To aim a
shot.

Trundle shot.

A Carriage is a bag of Canvasse made upon a frame of a round piece of wood somewhat lesse than the bore of the piece, they make them also of paper, they have also Carriages or rather cases for Carriages made of Latten to keep the Carriages in, which is to have no more powder in them than just the charge of your piece, and they are closely covered in those cases of Latten, to keep them dry, and from any mischances by fire, and are far more ready and sure than your Ladles or Budgebarrells. A Budgebarrell is a little Barrell made of Latten, filled with powder to carry from place to place for fear of fire: in the cover it hath a long neck to fill the Ladles withall without opening. A Ladle is a long Case with a piece of thin Copper at the end like halfe a Carriage, in breadth and length is much as will hold no more powder than the one charge for the piece it belongs to. A Sponge is such another Case, with a piece of a Lambes skin at the end about it to thrust up and down the piece, to take off the dust, moisture, or sparkes of fire if any remain in her. And a Rammer is a bob of wood at the other end to ramme home the powder and the Waddings, Waddings is Okeum, old cloths, or straw, put after the powder and the Bullet. A Case is made of two pieces of hollow wood joyned together like two halfe Carriages fit to put into the bore of a piece, and a case shot is any kinde of small Bullets, Bales, old iron, or the like to put into the case to shoot out of the Ordnances or Ordnements, these will do much mischief when we be bored and bored: but for Sponges and Rammers they use now a Staffe Rope a little more than the length of the piece, which you may turn and winde within board as you will, with much more ease and safety than the other.

Round shot is a round Bullet for any piece: or what shot is a so round shot, but it hath a long spike of Iron & with it as if it did go thorow the middest of it, the ends whereof are commonly armed for fear of hurting the piece, which is to bind a little Okeum in a little Canvasse at the end of each Pike. Trundle shot is onely a bolt of Iron or

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ten or eighten inches in length; at both ends sharp pointed, and about a handfull from each end a round broad boole of lead according to the bore of the piece cast upon it. A single shot runnes loose with a Muckell, to be shortened when you putt it into the piece, and when it flies out it doth spread it selfe, it hath at the end of either barre a halfe Bullet either of lead or iron. Chaine shot is two bullets with a chaine betwixt them, and some are contrived round as in a Ball, yet will spread in flying their full length in breadth; all these are used when you are near a Ship to shatter down spars, masts, shrouds, keels, the sails, spoile the men, or any thing that will worke the decks. Fire works are divers, and of many compositions, as Arrows trimmed with wolde fire to strike in the sails of Ships and set her on burning. Pistols of wilde fire to scallie burning into a Ship side to fire her. There is also divers sorts of Granados, some to breake and fly in abundance of pottes every way, as will your brasse balls and earthen pots which when they are covered with quartered bullets strike in pitch, and the pots filled with good powder, in a croud of people will make an incredible slaughter; some will burn under water, and never extinguish till the stuffe be consumed; some onely will burn and sume out a most stinking poison smoke; some, being but onely an Oile, being notated on any thing made of dry wood, will take fire by the heat of the Sun when the Sun shines hot. There is also a powder, which being laid in like manner upon any thing subject to burn, will take fire if either any raine or water light upon it; but those inventions are bad on shore, but much worse at Sea, and are naught because so dangerous, and not easie to be quenched, and their practice worse, because they may do as much mischief to a friend as to an enemy, therefore I will leave them as they are.

There are also divers sorts of powder, the Serpentine is like dust and weak, and will not keep at Sea but be moist. The common sort is great corned powder but grosse, and onely used in great Ordnance. Your fine corned powder for hand Guns is in goodnesse as your salt-Peter is oft re-

Langrell shot.

Chaine shot.

Fire works.
Arrows of wilde fire.
Pikes of wilde fire.
Granados of divers sorts.
Brasse Balles.

Powder, fine
Serpentine powder
Grosse corned Powder.
Fine corned Powder.

fined, and from ten pence a pound to eightene pence a pound.

A Tomkin.
A Fid.

A Tomkin is a round piece of wood put into the Peeces mouth and covered with Tallow, and a fid a little Damm made like a nail put in at the touch hole, and covered with a thin lead bound above it to keep the powder dry in the Pece. Shackels are a kinde of Rings but not round, made like them at the hatches corners (by which we take them up and lay them down) but bigger, fixed to the middest of the ports within board, through which we put a billet to keep fast the port for lying open in foul weather, which may easily endanger, if not sink the Ship. To cloy or poison a Pece, is to drive a nail into her touch hole, then you cannot give fire. And to uncloy her, is to put as much oil as you can about the nail to make it glib, and by a traine give fire to her by her mouth, and so blow it out.

Shackels.

To cloy a
Pece or poi-
son her.
To uncloy.

Compass
Callipers.

Compass Callipers belongs to the Gunner, and is like two halfe Circles that hath a handle and joint like a paire of Compasses, but they are blunt at the points to open as you please for to dispart a Pece. A Horne is his touch bar, his primer is a small long piece of iron, sharpe at the small end to pierce the Cartrage thorow the touch hole. His Lint stock is a handsome carved stick, more than halfe a yard long, with a Croke at the one end to hold fast his Hatch, and a sharpe pike in the other to strike it fast upon the Deck or platform upright. The Gunners quadrant is to level a Pece or mount her to any randon. A Darke Lanthorne is as well to be used by any body as he. For Mortars, or such chambers as are on'y used for triumphe, there is no use for them in the service: but for Carrioners, Harquebuses, Muskets, Bastard-muskets, Colivers, Crabuts, Carbine, long Pistols or short Pistols, there belong to them Bandoliers, bullet Bags, Muzzles, Scowlers, melting Lables, Lead, Bolts of all sorts to cast their shot. Quarter Bullets is but any bullet quartered in four or eight parts, and all these are as usefull a ship-board as on shore. For the soul, trinke, boze, fortification, the diversity of their use, and

Horne.
Priming Iron.

Lint stocke.
Gunners qua-
drant.
Dark Lant-
horn.
Morters.
The names of
small Peeces,
and their in-
plements.
Bandiliers.
Bullet bags.
Wormes.
Scowlers.
Melting
Lables.
Lead Molde.
Quartered
shot.

differs

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[illegible]

A Table of Proportion for the weight and shooting of great Ordnance.

	The names of the great Peeces.	The height of the Peece in inches.	The weight of the peece in Pound.	The weight of the shot in Pound.	The breadth of the ladle in inches.	The length of the tube in inches.	The angle of the point in degrees.	The range in Paces.
These Peece be most serviceable for battery, being within 80 paces to their mark, which is the chief of their force.	1 A Canon Royall.	8 $\frac{1}{2}$	8000	66	30	13 $\frac{1}{2}$	80	1930
	2 A Canon	8	6000	60	27	12	85	2000
	3 A Canon Serpentine	7 $\frac{1}{2}$	5500	53 $\frac{1}{2}$	25	10 $\frac{1}{2}$	96	2000
	4 A Bastard Canon	7	4500	41 $\frac{1}{2}$	20	0	120	1800
	5 A demy Canon	6 $\frac{1}{2}$	4000	30 $\frac{1}{2}$	18	9 $\frac{1}{2}$	133	1700
	6 A Canon Petro	6	3000	24 $\frac{1}{2}$	14	9	171	1600
These Peece be good and also serviceable to be mixt with the above Ordnance for battery to peece being crost with the rest, as also fit for Castles, Forts and walls to be planted, and for defence.	7 A Culvering	5 $\frac{1}{2}$	4500	17 $\frac{1}{2}$	12	8 $\frac{1}{2}$	200	1500
	8 A Basilisco	5	4000	15 $\frac{1}{2}$	10	7 $\frac{1}{2}$	240	1500
	9 A demy Culvering	4 $\frac{1}{2}$	3400	9 $\frac{1}{2}$	8	6 $\frac{1}{2}$	300	1500
	10 A Bastard Culvering	4	3000	7	6 $\frac{1}{2}$	6	388	1800
	11 A Sacre	3 $\frac{1}{2}$	1400	5 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$	490	1700
	12 A Minion	3 $\frac{1}{4}$	1000	4	4 $\frac{1}{2}$	4 $\frac{1}{2}$	600	1600
These Peece are good and serviceable for the field, and most ready for defence.	13 A Faulcon	2 $\frac{1}{2}$	660	2 $\frac{1}{4}$	2 $\frac{1}{4}$	4 $\frac{1}{2}$	1087	1500
	14 A Faulcon	2 $\frac{1}{4}$	800	3	3	4 $\frac{1}{2}$	800	1500
	15 A Faulconet	2	500	1 $\frac{1}{2}$	1 $\frac{1}{2}$	3 $\frac{1}{4}$	1950	1400
	16 A Serpentine	1 $\frac{1}{2}$	400	1 $\frac{1}{2}$	1 $\frac{1}{2}$	2 $\frac{1}{4}$	7200	1300
	17 A Rabonet	1	300	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	4800	1200

Note that seldome in Ships they use any Ordnance greater than Demy Canons, nor have they any certainty either at point blanke or any random.

Note your Serpentine powder in old time was in meale, but now coyned and made stronger, and called Canon coyne powder.

But that for small Ordnance is called corn powder fine, and ought to have in strength a quarter more, because those small pieces are better justified than the greater.

Now if you have but one sort of powder for all, abate $\frac{1}{4}$ part, and cut off $\frac{1}{4}$ of the breadth and length of your Tube.

But Carriages are now found the best and most readiest.

Provided alwayes, that all Shot must be a quarter lesse than the height of the Piece.

1	the Captain's
2	the Lieutenant
3	the Master
4	the Surgeon
5	the Carpenter
6	the Gunner
7	the Cook
8	the Steward
9	the Chaplain
10	the Purveyor
11	the Writer
12	the Barber
13	the Shoemaker
14	the Tailor
15	the Saddler
16	the Smith
17	the Blacksmith
18	the Wheelwright
19	the Cooper
20	the Cartwright
21	the Weaver
22	the Dyer
23	the Tinker
24	the Cordwainer
25	the Basketmaker
26	the Bonnetmaker
27	the Hatter
28	the Perfumier
29	the Jeweller
30	the Goldsmith
31	the Silversmith
32	the Engraver
33	the Painter
34	the Sculptor
35	the Architect
36	the Engineer
37	the Surveyor
38	the Astronomer
39	the Mathematician
40	the Philosopher
41	the Historian
42	the Poet
43	the Dramatist
44	the Actor
45	the Musician
46	the Dancing Master
47	the Gamester
48	the Gambler
49	the Thief
50	the Rogue

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CHAP. XV.

How they divide their shares in a man of War, what Bookes and Instruments are fit for a Sea-man, with divers advertisements for Sea-men, and the use of the petty Tally.

The Ship hath one third part, the victuallar the other third, the other third part is for the Company, and this is divided thus in shares.

Shares.

The Captain hath	10	In some but 9
The Lieutenant	9	as he agreeth with the Captaine.
The Master	8	In some but 7
The Mate	7	
The Chirurgion	6	
The Gunner	6	
The Boatswaine	6	
The Carpenter	6	
The Trumpeter	6	
The 4 quarter Gall	5	apiece, or
The Coper	5	
The Chirurg. Mate	5	
The Gunners mate	5	
The Carpent. Mate	5	
The Gun. Mate	4	
The Quar. Gunners	4	
The Trump. Mate	3	
The Steward.	4	
The Cook	4	
The Cor. Swaine	4	
The Swabber	4	

In English Ships they seldom use any Quarter, whose shares amongst the French is equal with the Boatswains, all the rest of the Pounders, or fore-mast-men according to their deserts, some three, some two and a half, some one and a half, and the boys one, which is a single share, or one and an half, or as they do deserve.

Now the Quarter, or his right hand mate, the Gunner, Boatswaine, and four quarter Quarters do make the shares, not the Captain who hath onely this privilege, to take away half a share, or a whole share at most, to give from one to another as he best pleaseth.

For to learn to observe the Altitude, Latitude, Longitude, Amplitude, the variation of the Compass, the Suns Azimuth and Altitude, to find the Sun and Moon, and know the tides, your Rumbs, pitch your Card, say your Compass, and get some of these Books, but practice is the best.

Quarter Wrights Errors of Navigation.

Quarter Taps Sea-mans Balance.

The Art of Navigation.

The Sea Regiment.

The Sea-mans Secret.

Waggoner.

Quarter Gunter Works.

The Sea-mans Glass for the Scale.

The New Attractive for Variation.

Quarter Wright for use of the Globe.

Quarter Hewes for the same.

Instruments fitting for a Sea-men.

Compasses so many pair and sorts as you will, an Astro-late Quadrant, a Cross-staff, a Back-staff, an Astro-abe, a Portulac.

A young Gentleman that desires command at Sea, ought well to consider the condition of their Ship, Manned and Company, for if there be more learners than Sailers, how slightly soever many esteem Sailers, all the work to save Ship, goods, and lives must lie upon them, especially in foule weather, then their labour, hazard, wet, and

Advertisements for young Commanders, Captains, and other Officers.

cold, is so incredible I cannot expresse it. It is not then the number of them that here can say at home what I cannot do I can quickly learn, and what a great matter is it to fall a ship, or go to Sea; surely those for a good time will do more trouble than good; I confesse it is most necessary such should go, but not too many in one ship; for if the labour of these people should lie upon thirty, (as many times it doth) they are so over-charged with labour, buisness, and other straining themselves they fall sick of one disease or other, for there is no helping nor excuses with storms, gulls, over-grown Seas, and ice-shores, and when their victuall is distressed & endangers all men of all other professions in lightning, thunder, storms and tempests, with rain and snow may shelter themselves in dry houses by good fires, but those are the chief times Sea-men must stand to their tackling, and attend with all diligence their greatest labour upon the decks. Many suppose any thing is good enough to serve men at Sea, yet nothing sufficient for the abuse, either for their healths, for their safe, or estates or estate; A Commander at Sea should do well to think the contrary, and provide for himself & company in like manner; also seriously to consider what will be his charge to furnish himself at Sea with bedding, linnen, armes, and apparel, how to keep his table aboard, and his expenses on shore, and provide his petty Tally, which is a competent proportion according to your number of these particulars following.

Fine wheat flower close and well packed, Rice, Currants, Sugar, Prunes, Cinnamon, Ginger, Pepper, Cloves, green Ginger, Oil, Butter, Holland cheese, or old cheese, Wine-vinegar, Canarie sack, Aqua-Vitæ, the best Wines, the best waters, the wyce of Limons for the scurvy, white Bisket, Datmeal, Cammons of Bacon, dried Peats tongues, Beef packed up in Vinegar, Legs of Mutton minced and stewed, and close packed up with tried Butter or Butter in earthen pots. Ten pintottah, Saffragars, Sparmalade, Buckets, Almonds, Conista and such like.

Some it may be will say I would have men rather to feast than fight; But I say the want of those necessities occasions

The petty
Tally.

The use of the
petty Tally.

the losse of more men than in any English Fleet hath been
 since 88. For when a man is ill, or at the point of death,
 I would know whether a dish of buttered Rice with a little
 Cynamon, Ginger, and Sugar, a little minced meat, or rost
 Beef, a few stew'd Pzunes, a race of green Ginger, a Flap-
 Jack, a Ran of fresh water brewed with a little Cynamon,
 and Sugar be not better than a little po: John, or salt fish
 with Oil and Mustard, or Bisket, Butter, Cheese, or Oat-
 meal-pottage on Fish-bayes, or on Flesh-bayes, Salt, Beef,
 Pork and Pease with six shillings beer, this is your ordinary
 ships allowance, and good for them are well if well condition-
 ed, which is not alwayes as Sea-men can (too well) witnesse
 And after a storme, when po: men are all wet, and some have
 not so much as a cloth to wring them, shaking with cold, few of
 those but will tell you, a little Sack or Aqua-vitæ is much
 better to keep them in health, than a little small Beer or cold
 water although it be sweet. Now that every one should provide
 things for himself, few of them have either that providence or
 means, and there is neither Ale-house, Tavern, nor Inn to
 burn a faggot in, neither Grocer, Boulterer, Apothecary, nor
 Butchers Shop, and therefore the use of this petty Tally is
 necessary, and thus to be employed as there is occasion. To
 entertain Strangers, as they are in quality every Comman-
 der should shew himself as like himself as he can, as well for
 the credit of the Ship, and his letters forth as himself; but
 in that herein every one may moderate themselves according
 to their own pleasures, therefore I leave it to their own dis-
 cretions, and this brief Discourse, and my self to their friend-
 ly construction, and good opinion.

FINIS.